CEIS Centre for Economic and International Studies
TOR VERGATA

# CEIS Tor Vergata

RESEARCH PAPER SERIES

**Vol. 10, Issue 6, No. 233 – May 2012**

# Corporate Social Responsibility and Earnings Forecasting Unbiasedness

Leonardo Becchetti, Rocco Ciciretti and Alessandro Giovannelli

# Corporate Social Responsibility and Earnings Forecasting Unbiasedness*

Leonardo Becchetti†, Rocco Ciciretti‡ and Alessandro Giovannelli§

February 6, 2013

**Abstract**

We investigate the relationship between Corporate Social Responsibility (hereafter CSR) and I/B/E/S analysts' earnings per share (EPS) forecasts using a large sample of US firms for the 1992-2011 period. Based on literature findings we decompose the CSR effect into four factors: accounting opacity, corporate governance, stakeholder risk, and overinvestment. We document that all of them significantly affect both the absolute forecast error on EPS and its standard deviation controlling for forecast horizon, number of analysts and forecasts, and for year, industry, broker house effects. Consistently with our ex ante hypotheses, overinvestment, stakeholder risk and accounting opacity have a positive effect increasing both dependent variables, while corporate governance quality has a negative effect. A crucial aspect of our findings is that high CSR quality in terms of the four factors (i.e. accounting transparency, high corporate governance quality, stakeholder risk mitigation and absence of overinvestment) contributes to making earning forecasts unbiased as unbiasedness is generally met in the subsample of the top 33 percent CSR quality companies, while it is markedly violated in the subsample of the bottom 33 percent CSR companies.

**Keywords:** Earnings per Share; Analyst Forecast; Corporate Social Responsibility.

**JEL Classification Numbers:** D84; E44; F30; G17; C53.

*Previous versions of this paper have been circulated as SSRN-CEIS Research Paper No. 233 and SIRP-WP 12-06. We are indebted to an anonymous referee for the helpful comments received. We also thank Iftekhar Hasan, Annalisa Fabretti, Marco Nicolosi for useful comments and suggestions. We finally thank all the participants in the 2012 $XXI$ International Conference on Money, Banking, and Finance in Rome; the 2012 $5^{th}$ International Conference on Corporate Social Responsibility in Berlin; and seminar participants at Fordham University New York. SIRP (MISTRA) grant is acknowledged. The usual disclaimer applies.

†DEDI Department, University of Roma Tor Vergata. e-mail: *becchetti@economia.uniroma2.it*

‡Department of Economics and Finance, University of Roma Tor Vergata *and* EPRU, University of Leicester School of Management. Corresponding address: Via Columbia 2, 00133 Roma-Italia. Phone +39-06-72595929. Fax +39-06-2040219. e-mail: *rocco.ciciretti@uniroma2.it*

§Department of Economics and Finance, University of Roma Tor Vergata. e-mail: *alessandro.giovannelli@uniroma2.it*

# 1 Introduction

Advertising social and environmental friendly behavior, issuing sustainability reports and hiring CSR experts have become increasingly frequent corporate practices in the most recent years.[1]

In parallel with its increasing importance, and with the extension of (at least formal) CSR practices, academicians and practitioners have ascertained whether CSR is a "win-win" strategy by investigating the relationship between CSR and corporate performance on different dimensions. A large number of empirical contributions have addressed this issue but without conclusive results.[2] The main reason is that CSR entails costs of more closely addressing the needs of a wider range of stakeholders and several potential benefits. Principal among the latter one higher intrinsic motivations and lower shirking and turnover among workers, minimization of transaction costs with stakeholders, anticipation of product and process innovation in environmental friendly and energy saving production techniques, enhanced reputation on product quality, and higher demand from socially concerned consumers.[3] Results are therefore necessarily time and context dependent since they vary according to the specific relevance of each of the above mentioned factors. Moreover, whilst one of the potential gains from CSR is the reduction of some forms of risk or of the likelihood of a negative catastrophic event (Benabou and Tirole, 2010), stock returns or corporate profits are not the best indicators to measure it.[4] Our aim in this paper is to show that an interesting unexplored dimension on which it is possible in principle

[1] In 2005 90% percent of Japanese companies, 71% percent of UK companies and 32% percent of US companies participated in CSR reporting (KPMG, 2005). The ICCA global report survey (2010) documents that 31% percent of the top 500 Fortune companies have a separate CSR department. The Nielsen Global Report (2012) calculates that 46% percent of interviewed consumers are willing to pay more for socially and environmentally sustainable products. Even though the willingness to pay for CSR tends to be upward biased, these data and revealed preferences of market shares of socially responsible products show that the phenomenon is substantial (Carson et al. (2001).

[2] Findings documenting a positive link may be found, among others, in Ruf et al. (2001), Baron et al. (2008), Jo and Harjoto (2007), Jo and Harjoto (2011), and Vogel (2005). Inconclusive results are reported in McWilliams and Siegel (2001), Aupperle et al. (1985), and Margolis and Walsh (2003). Negative links are found by, among others, Preston and O'Bannon (1997) and Freedman and Jaggi (1986). Becchetti et al. (2008) document with panel data on a large sample of US firms that CSR adoption has positive effects on added value, while it has negative effects on return on equity. For the literature on the relationship between CSR and productive efficiency see, among others, Shadbegian and Gray (2006) and Vitaliano and Stella (2006). For the literature on CSR and financial performance see, among others, Bauer et al. (2005). Confirming the lack of consensus on the sign of the relationship, Margolis and Walsh (2003) report in their meta-paper, which evaluates empirical findings of this literature, that: "*When treated as an independent variable, CSR is found to have a positive relationship to corporate financial performance in 42 studies (53%), no relationship in 19 studies (24%), a negative relationship in 4 studies (5%), and a mixed relationship in 15 studies (19%)*".

[3] On the positive impact on worker productivity see the efficiency wage (Shapiro and Stiglitz, 1984; Salop, 1979; Malcomson, 1981), the gift exchange (Akerlof, 1982), and the intrinsic motivation (Ryan et al., 1991; Frey and Oberholzer-Gee, 1997; Kreps, 1997) literature. On the minimization of transaction costs with stakeholders see Freeman (1984). On positive reputation effects see Minor (2009).

[4] Becchetti and Ciciretti (2011) show in this regard that CSR rating agencies were better able than standard financial rating agencies to capture with ex-ante negative scores the Lehman Brothers default and that, at the event date, the market adjusted the weight given to such scores generating significant abnormal returns for stocks with similar social ratings.

to evaluate the relationship between CSR and risk is that of analysts' forecasts on earning.[5] By comparing this information, and calculating the absolute value of the earning forecast error and its dispersion for high/low CSR oriented firms, it is possible to check how CSR affects an ex-post measure of risk and uncertainty represented by the distribution of the deviation between ex-ante analysts' forecasts and actual ex-post released corporate earnings.

In order to do so we use information from one of the most widely adopted CSR scoring standards, that is, the Kinder, Lydenberg, and Domini Research & Analytics, Inc. (henceforth RiskMetrics-KLD) rating criteria.[6] As well known, RiskMetrics-KLD ratings outline factors of strength and weakness in eight different CSR domains (community, corporate governance, diversity, employee relations, environment, human rights, product quality, and controversial business) giving a positive (negative) score for each of the strength (weakness) elements for which the firm qualifies within each domain.[7] We argue that there are at least four channels (accounting opacity, quality of corporate governance, stakeholder risk, and overinvestment) through which CSR (and, more specifically, RiskMetrics-KLD scores for social responsibility) should affect the absolute earning forecast error.

First, if CSR implies grater care for stakeholders, it may also be conceived as positively affecting corporate care in the relationship with analysts and, more in general, as reducing opacity in the communication strategy with the public. More specifically, we know that managers are tempted to manipulate earnings by manipulating accruals (Sloan, 1996; Chaney et al., 2011). For instance, discretionary special charges may be used in order to inflate corporate results or to avoid the negative signal of nonpositive earnings per share to the market. This behavior may generate unpredictable shocks to the "ordinary" process of earning generation by the firm, thereby creating additional uncertainty and error in analyst forecasts. This is because the forecasting accuracy of analysts is obviously expected to be higher for earnings generated by the ordinary activity of the firm than for end of period extraordinary operations used to manipulate earnings. If this is true, CSR would generate a relatively lower forecast error and lower dispersion of it. On our data, accounting accuracy can be measured with the criteria used by the CSR rating company RiskMetrics-KLD to assess corporate CSR weaknesses. More specifically, one of these criteria assigns negative points if "*The company restated its earnings over an accounting controversy, has other accounting problems, or is involved with some other controversy not covered by other RiskMetrics-KLD ratings*" while another is if "*The company has been involved in noteworthy controversies on public policy issues and/or has a very poor record of transparency and accountability concerning its political involvement in state or federal*

[5] Higher absolute value and dispersion of the earning forecast error produce, by definition, extra risk in terms of higher uncertainty in predicting firm behavior.

[6] In November 2009, RiskMetrics Group acquired the Kinder, Lydenberg, and Domini Research & Analytics, Inc. (KLD). MSCI Inc. acquired RiskMetrics Group Inc. in June 2010. KLD was founded in 1988 amd it was an independent investment research firm providing management tools to professionals integrating environmental, social and governance factors (ESG) into their investment decisions.

[7] For a detailed description of RiskMetrics-KLD criteria see Appendix A.

*level U.S. politics, or in non-U.S. politics*" (see Appendix A).

A second well known potentially beneficial effect of CSR is risk mitigation. Goss and Roberts (2011) explain it by arguing that low CSR implies externalizing social costs on the society and, more specifically, on some groups of stakeholders, thereby generating negative externalities on them. The society understands this and may impose penalties on firms guilt of it in the past. This hypothesis has a long tradition in the literature. Freeman (1984) argues that CSR may be an optimal choice to minimize transaction costs and potential conflicts with stakeholders. In an empirical test of the risk mitigation hypothesis to reputational risk, Minor (2009) shows, on a sample of 184 events, that product recalls generate significantly less negative abnormal returns (3 percent gain) for firms with higher social rating. The reason is that recalls are more likely to be interpreted as accidents not due to corporate negligence (and with lower consequences on future unobserved product quality). Considering the median market value of sample firms (23 billion US Dollars), the net CSR gain per event is 600 million dollars. Financial data seem to confirm it, since CSR stocks perform generally better when different risk dimensions such as idiosyncratic volatility are accounted for (see among others Boutin-Dufresne and Savaria, 2004). If CSR is assumed to minimize transaction costs with stakeholders (and reduce litigation), it consequently tackles an important source of risk (conflicts with stakeholders may translate into significant corporate losses, especially when they lead to class actions), thereby reducing uncertainty and variability of earnings. Similarly, judicial trials and litigations are explicitly indicated among factors determining CSR weaknesses (negative points in CSR indicators).[8] Hence, we may reasonably assume that less CSR oriented firms have previously incurred (and are likely to incur more in the future) these kinds of problems, which adds an extra factor of uncertainty in analysts' forecasts.[9]

A third potential effect of CSR works through the quality of corporate governance channel. As well known, corporate governance is one of the main CSR domains, and there are contributions in the literature suggesting that "corporate care" for analysts in the form of management earnings forecasts reduces forecast error. More specifically, Ajinkya et al. (2005) demonstrate that stronger corporate governance, as measured by the greater presence of outside directors

[8] In the RiskMetrics-KLD diversity domain, negative CSR points are assigned if "*The company has either paid substantial fines or civil penalties as a result of affirmative action controversies, or has otherwise been involved in major controversies related to affirmative action issues.*" In the employees domain, negative CSR points are assigned if "*The company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies.*" In the environment domain, negative CSR points are assigned if "*The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations, or it has a pattern of regulatory controversies under the Clean Air Act, Clean Water Act or other major environmental regulations.*"

[9] Note that, in principle, our theoretical prediction on the negative effect of CSR on the earning forecast bias may apply also to models in which the earning forecast bias does not contradict rationality. In Lim (2001) a small upward bias represents the optimal choice for analysts who want to acquire a preferential relation with the firms in terms of quality of information received. The demand for preferential treatment may be higher for firms with less accounting transparency or higher shocks due to conflicts with stakeholders. Moreover, low CSR firms may be more inclined to discriminate among analysts and concede such preferential treatment.

and institutional investors, is associated with more frequent and accurate management earnings forecasts. Furthermore, Brown and Zhou (2012) show that analyst forecasts improve after management forecasts. We may therefore measure corporate governance quality as the differences between KLD strengths and weaknesses in this specific domain.
A fourth potential effect of CSR is overinvestment. As well known, CSR involves a departure from the mono-dimensional and easily verifiable profit maximization goal toward the less clearly measurable target of satisfying a wider range of stakeholders. As a consequence, CSR enhances managerial freedom and may naturally become a domain of arbitrary conduct with the risk of cash flow waste. In this respect, managers may be tempted to overinvest in CSR in order to maximize their personal goals of visibility and recognition (so as to increase their prestige or to monetize it later by bargaining higher compensation) at the expense of firm shareholders. The arbitrariness and unpredictability of their behavior may correlate CSR overinvestment with higher forecast errors. Barnea and Rubin (2010) demonstrate that the decision to invest in CSR is negatively related to insider ownership, and they interpret this finding in light of the overinvestment hypothesis. KLD strengths therefore naturally lend themselves to testing whether this hypothesis works.

Consistently with the above mentioned literature, we assume that the four factors have different impacts on the absolute value and the standard error of the earning forecast error. While corporate governance quality should impact on it negatively (reducing the absolute forecast error), accounting opacity, overinvestment and stakeholder risk should affect it positively (increasing the absolute forecast error) by producing shocks which make earning forecasts less predictable. Our empirical findings do not reject our hypotheses documenting a significant negative nexus of the first three factors (and a negative nexus of the fourth) with both (absolute value and standard deviation) measures of the bias, net of the impact of standard controls such as the number of analysts, the number of forecasts, four-digit industry dummies, firm size, year and broker house effects. An important consequence of our main result is that, if we test unbiasedness on the bottom and top 33 percent firms in terms of CSR quality by jointly considering the four factors, we find that it is rejected for the bottom, while it is generally not so for top CSR firms. Our findings accordingly enrich and complement findings in the earning forecast error literature documenting the presence of an earning forecast bias (Nordhaus, 1987) which disappears once discretionary special charges are taken into account (Keane and Runkle, 1998).
The paper is divided into four sections (introduction and conclusions included). In the second section we describe our combined database, which includes I/B/E/S individual analysts' earning forecasts and RiskMetrics-KLD scores. In the third section we provide descriptive statistics and we illustrate and comment on our econometric findings. The fourth section concludes.

## 2 The Database

Our empirical analysis is based on U.S. analysts' forecasts of U.S. firm earnings from 1992 through 2011.[10] Data on forecasted and actual earnings per share are taken from the I/B/E/S database; data for CSR scores (Strengths and Concerns for four variables of interest such as *Accounting Opacity*, *Net Corporate Governance*, *Stakeholder Risk*, and *Overinvestment*) are from RiskMetrics-KLD; data on corporate stock prices and total assets are from Datastream.[11] After merging the above three datasets, the total number of observations is 616,790, with 6,364 unique analysts and 1,867 unique companies (the number of firms included in the analysis increases over time from 233 unique companies in 1992 to 1,037 unique companies in 2011).[12] We define as $E[EPS]^{i,j}_{T,h}$ the earnings per share forecast on the company $i$ formulated by the analyst $j$ for the fiscal year T. $h$ denotes the forecast horizon calculated as the difference in days between the forecast date (I/B/E/S [Institutional Brokers Estimate System] variable ESTDATS) and the end of the fiscal year (I/B/E/S variable FPEDATS). Note that, in a few cases the forecast horizon $h$ can assume also negative (or zero) values, since it may happen that an analyst continues to produce forecasts for a given firm also after the end of the fiscal year but before the company completes its accounting procedures and reports the official data (I/B/E/S variable REPDATS). For this reason, to avoid additional uncertainty in the distribution of the earning forecast error, we delete all forecasts made after the end of fiscal year $T$.

**Insert Figure 1.**

Figure (1) illustrates an example, for the year 1997, of the distribution of data that will be used in what follows. Each point represents the intersection of the forecast horizon $h$ with analyst $j$ and firm $i$ for which the analyst provides the earnings forecast. A company's stock is defined by the six-digit Committee on Uniform Securities Identification Procedures (CUSIP). We associate with it a four-digit industry code according to the Standard Industry Classification System (SIC code).

RiskMetrics-KLD divides the CSR criteria into eight broad categories: i) community; ii) corporate governance; iii) diversity; iv) employee relations; v) environment; vi) human rights; vii)

[10] Data are from Ciciretti et al. (2009).

[11] We use data for the entire period covered and released by KLD (1991-2010). Because in the empirical estimation KLD regressors are lagged variables our final dataset goes from 1992 to 2011.

[12] RiskMetrics-KLD provides research, indexes, consulting and compliance services to institutions for integration of environmental, social and governance (ESG) factors into their investment strategies. Data are collected from a wide variety of companies, government, non-government organization and media sources. RiskMetrics-KLD tracks each company through more than 14000 global media sources daily. RiskMetrics-KLD uses three processes to maintain the accuracy and currency of its research: i) continuous updates in the form of daily updates from media sources and special updates from NGOs and government data sources; ii) yearly fiscal year updates from company public documents; iii) a comprehensive annual review that includes analysis of all information gathered throughout the year, review of company websites and CSR reports, and direct communication with the company, NGOs, and research partners. RiskMetrics-KLD indexes (i.e. FTSE KLD 400 Social Index) are generally considered as benchmarks for CSR investment strategies and they are designed to be transparent, representative and investable.

product quality; and viii) controversial business issues. For each of them, it identifies strengths and weaknesses, and indicates a series of corporate actions falling within one of the two categories.[13] An advantage of our analysis is that it relies on raw RiskMetrics-KLD scores and not on a comparison between FTSE KLD 400 Social Index constituents and a complementary sample.[14] This avoids the well known "fixed number index" confounding effects of non index stocks qualifying for high CSR standards and in the waiting list group or high CSR stocks in the process of losing their strengths which may be on a watch list even though they are still in the index.

## 3 Empirical findings on the absolute forecast error

We comment on descriptive statistics concerning the variables used for the econometric analysis by focusing first on the four main variables of interest (RiskMetrics-KLD's ratings and I/B/E/S Details analysts' earning forecasts).[15] The average number of RiskMetrics-KLD *Accounting Opacity* is 0.07, *Net Corporate Governance* is -0.33, *Stakeholder Risk* is 0.92, and *Overinvestment* is 2.24. The maximums for the four measures are 2, 2, 9 and 21 respectively, while the minimum is zero for all measures except *Net Corporate Governance* which scores -4. The median score is zero for all the variables except *Overinvestment* which scores 1.

**Insert Table 1.**

While the construction of the first three CSR indicators does not require further explanation the *Overinvestment* variable is built as the sum of all KLD strengths. The rationale is that after controlling for accounting opacity, quality of corporate governance and stakeholder risk, all the initiatives on the positive side of CSR may fall under the overinvestment hypothesis,

[13] Given the well known problems of aggregation and attribution of weights to different qualitative items, RiskMetrics-KLD is choice is to provide raw data by attaching $-1$ or $+1$ if the firm qualifies respectively for the specific factor of strength and weakness. For a detailed description of strengths and weaknesses see Appendix A.

[14] The FTSE KLD 400 Social Index is a float-adjusted, market capitalization-weighted, common stock index of US equities. Launched by KLD in May 1990, the FTSE KLD 400 Social Index (formerly Domini 400 Social Index, DSI 400) was the first benchmark index constructed using environmental, social and governance (ESG) factors. The DSI 400 was renamed the FTSE KLD 400 Social Index in July 2009.

[15] *AccountingOpacity* is the sum of CGOV-con-I and CGOV-con-X. *NetCorporateGovernance* is the difference between the corporate governance strengths (CGOV-str-A, CGOV-str-C, CGOV-str-D, CGOV-str-E, CGOV-str-F, CGOV-str-X) and the corporate governance concerns (CGOV-con-B, CGOV-con-F, CGOV-con-G, CGOV-con-H, CGOV-con-I, CGOV-con-J, CGOV-con-K, CGOV-con-X).
*StakeholderRisk* is the sum of COM-con-A, COM-con-B, COM-con-C, COM-con-D, COM-con-X, DIV-con-A, DIV-con-X, EMP-con-B, EMP-con-X, ENV-con-X, HUM-con-D, HUM-con-F, HUM-con-G, HUM-con-X, PRO-con-A, PRO-con-D, PRO-con-E, PRO-con-X.
*Overinvestment* is the sum of all the KLD strengths COM-str-A, COM-str-B, COM-str-C, COM-str-D, COM-str-F, COM-str-G, COM-str-H, COM-str-X, DIV-str-A, DIV-str-B, DIV-str-C, DIV-str-D, DIV-str-E, DIV-str-F, DIV-str-G, DIV-str-H, DIV-str-X, EMP-str-A, EMP-str-B, EMP-str-C, EMP-str-D, EMP-str-F, EMP-str-G, EMP-str-H, EMP-str-X, ENV-str-A, ENV-str-B, ENV-str-C, ENV-str-D, ENV-str-F, ENV-str-G, ENV-str-X, HUM-str-A, HUM-str-D, HUM-str-G, HUM-str-X, PRO-str-A, PRO-str-B, PRO-str-C, PRO-str-D, PRO-str-X. See Appendix A for RiskMetrics-KLD criteria details.

thereby creating shocks on earnings and reducing their predictability.
The mean number of analysts per firm is 66.83, while the mean number of forecasts per firm is 1,157.75, documenting that we have, on average, more than 17 forecasts per analyst on a given firm in the overall time period (1992 - 2011). These numbers are extremely stable across different release date subsamples. Following a standard approach in the literature, we calculate the absolute earning per share forecast error (AFE) for company $i$ by analyst $j$ made for the fiscal year $T$ at the $h$ distance (forecast horizon) from the release date as:

$$AFE^{i,j}_{T,h} = \frac{|E[EPS]^{i,j}_{T,h} - EPS^i_T|}{P^i_{T-1}} \tag{1}$$

that is, as the absolute difference between the earning per share forecasted at the $h$ distance from the release date - $E[EPS]$ - and the released earning per share - $EPS$ - scaled by the share price at the end of the previous year - $P_{T-1}$. The average AFE is 0.02 in the overall sample, and it declines from 0.03 in the furthest forecast horizon interval (364 to 181 days before the end of the fiscal year) to 0.01 in the closest interval (less than 180 days before the end of the fiscal year to the day in which earnings are released).

**Insert Table 2.**

If we take the top and the bottom 33 percent (Panel A and Panel B, respectively) firms in terms of the four variables of interest derived from the RiskMetrics-KLD dataset (*Accounting Opacity*, *Net Corporate Governance*, *Stakeholder Risk*, *Overinvestment*), we find that in Panel A the average AFE is similar to Panel B (0.02). A lower average number of forecasts for the top 33 percent is documented with respect to the bottom 33 percent (426 against 1877). The median number of analysts is lower for Panel A with respect to Panel B (22 against 111).

**Insert Table 3.**

The goal of our econometric analysis is to verify whether the difference in absolute forecast error is significant net of the impact of other covariates. To this end we estimate the following specification:

$$\begin{aligned} AFE^{i,j}_{T,h} &= \alpha + \beta_1 AccountingOpacity^i_{T-1} + \beta_2 NetCorporateGovernance^i_{T-1} + \\ &+ \beta_3 StakeholderRisk^i_{T-1} + \beta_4 Overinvestment^i_{T-1} + \textstyle\sum_{l=1}^{7} \gamma_l X_l + \varepsilon^{i,j}_{T,h} \end{aligned} \tag{2}$$

where $AFE^{i,j}_{T,h}$ is the forecast error on earnings per share for company $i$ of analyst $j$ made for the fiscal year $T$ at the distance $h$ from the release date, $AccountingOpacity^i_{T-1}$ measures the company accounting standard, $NetCorporateGovernance^i_{T-1}$ is the net impact of company corporate governance, $StakeholderRisk^i_{T-1}$ represents the core risk mitigation effect, and $Overinvestment^i_{T-1}$ measures the core over investment effect.

The vector of X-controls includes: number of forecasts, number of analysts, distance from the release date (forecast horizon), and the natural logarithm of total assets. We also run different model specifications using industry fixed effects, broker house fixed effects, and year fixed effects. The results are set out in Table (4).

**Insert Table 4.**

The first specification includes 4-digit industry dummies and year fixed effect (column 1). The second specification includes also broker house dummies (column 2). This is because the dependent variable may be affected by time invariant industry and broker house specific effects. To provide some examples there may be industries in which variability and shocks to the economic environment make forecasts more difficult to formulate and brokerage houses may have policies affecting the forecast error.[16] For both specifications we repeat the estimates by splitting the sample based on the distance of forecasts from the release date (columns 1A - 1B and columns 2A - 2B respectively). The total number of observations is 616,790 in the first and second specifications, while in the (1A) and (1B) specifications observations are divided according to the forecast horizon. The four specifications produce consistent findings for the main non-dummy regressors.

As one would expect, the earning forecast bias increases in the distance from the release date.[17] Moreover, the number of analysts covering a stock reduces the bias as expected because the presence of a higher number of forecasters conveys less asymmetric information. This is net of the bias augmenting effect of the number of forecasts. The two variables therefore capture, on the one hand, a positive information effect produced by the arrival of a new analyst, and on the other, the number of shocks affecting corporate earnings by assuming that analysts issue or revise their forecasts after shocks. As is well known in the literature, size is a crucial driver of the bias. We proxy it with the natural logarithm of firm's total asset. We find that the variable significantly and negatively affects the bias. Among the several rationales set forth in the literature on this point, García-Meca and Sánchez-Ballesta (2006) emphasize that large firms tend to have less variable earnings and more stable growth patterns (Chung and Kim, 1994; Hodgkinson, 2001 and King et al., 1990). Furthermore, larger firms are likely to have more institutional information, which helps analysts to formulate more accurate predictions and more expert and sophisticated budgeting techniques with which to generate reliable information. Also on the analysts' side, the incentives to have better quality information are stronger in the presence of large and more liquid firms, since with these it is possible to obtain higher trading

[16] As mentioned in footnote 9, Lim (2001) shows that analysts may find it rational to err on the side of leniency in order to get better information from firms. Boni and Womack (2002) identify internal management pressures and pressures from institutional investor clients of the analysts among rationales for the bias. These factors are likely to be brokerage house specific.

[17] This finding is consistent with most contributions in the empirical literature: see among others Brown et al. (1987), Duru and Reeb (2002), Lang and Lundholm (1996), Lang et al. (2003), Lys and Soo (1995).

profits.

Net of the impact of the above mentioned controls, our findings do not reject the hypothesis that the four CSR factors affect the earning forecast bias significantly and in the expected direction. *Accounting Opacity*, *Stakeholder Risk* and *Overinvestment* significantly increase the bias, while the *Net Corporate Governance* quality significantly reduces it. The result is robust to the introduction of four-digit industry and (alternatively) broker house fixed effects. The split of the sample in terms of distance from the release date, however, makes the *Stakeholder Risk* variable not significant when getting closer to the release date. With regard to economic significance, the strongest effect is that of *Accounting Opacity*, where a unit change in the variable (that is, a point in one of the two related KLD concern scores) increases the bias by around 50 percent with respect to its sample average. Magnitudes of the other three effects are slightly smaller, since a unit change in *Net Corporate Governance* (*Overinvestment*) lowers (raises) by 10 percent the bias with respect to sample average. The *Stakeholder Risk* effect is even lower. Note, however that, while *Accounting Opacity* has one as its maximum value, *Overinvestment* and *Stakeholder Risk* have a much wider variation by construction (see the variable distribution in Table 1). Therefore, the magnitudes of their effects are much closer to that of *Accounting Opacity* if we calculate them in terms of one standard deviation change. In the following section we discuss some robustness checks on our main findings.

### 3.1 Robustness checks

In order to check the robustness of our results further we propose an alternative specification in which we add two lagged variables: the one-year lagged average firm forecast error and the one-year lagged firm/analyst forecast error (Table 5, columns 1 to 2).

**Insert Table 5.**

The first added variable ($AFE^{i}_{T-1}$) is positive and significant, documenting that the forecast error is autocorrelated.[18] The second added variable ($AFE^{i,j}_{T-1}$) is positive and significant as well. The significance of the four CSR effects remains unaltered in the four specifications, with the exception of the *Net Corporate Governance* effect. The most likely interpretation is that the latter is mainly a persistent *between effect* which is captured by the introduction of the lagged forecast error. The introduction of the lagged dependent variable stimulates reflections on the causality nexus between CSR factors and the earning forecast error. The documented links are less likely to suffer from reverse causality than the traditional nexus between CSR and corporate performance. The forecast error can be known only after the release date and, as such, it cannot affect CSR ratings which are formulated well below. However autocorrelation of the forecast error bias may cause both low CSR ratings and persistence in forecast error in the

[18]Note that this autocorrelation does not necessarily create room for profitable trading strategies as it may be the case for positive autocorrelation of stock returns.

following years. Similarly, it may well be that the past forecast error is in turn generated by persistent CSR weaknesses. Consider as well that the reverse link is not as clear as it could be in the CSR-corporate performance case, where it is well known that firms with higher earnings and rents can afford more CSR expenses (Margolis and Walsh, 2003). Moreover, it seems less likely that third drivers can cause the link between earning forecast bias and CSR as they do with the standard corporate performance-CSR nexus, where higher managerial discount rates may reduce short term bias, thereby positively affecting both variables. However, this is not true in at least one case since, as explained in Ajinkya et al. (2005), the link between governance and quality of management forecasts is likely to be endogenous since causality can run in either direction. This is because institutional investors interested in high governance standards can buy and restructure companies with weaker governance standards, thereby producing a causal nexus running from governance (CSR) to reduced forecast errors. Alternatively, such investors can buy firms that already have such standards (and hence higher forecast quality), making the causation run in the opposite direction. In this sense, the decomposition of CSR into four effects allows us to control for governance and accounting factors which are more likely to be endogenous, thus helping us to mitigate the problem. However, what matters more for our analysis is that CSR weaknesses are significantly associated with the earning forecast error. In the section which follows we show that this link, whatever the causality nexus, has important effects on the role of CSR in financial market efficiency.

### 3.2 Testing unbiasedness and efficiency

The findings presented in the previous sections suggest that analysis of the relationship between CSR and the earning forecast error may make an interesting contribution to the well known controversy on the relationship between the earning forecast bias literature and the literature testing market efficiency. As well known, Nordhaus (1987) documents that the bias violates weak efficiency and O'Brien (1988) finds weak evidence of upward bias. Keane and Runkle (1998), however, document that earning forecasts are unbiased after correcting for discretionary special charges. Our results discussed in the previous section bear out these findings by showing that three CSR factors (more transparent accounting practices, reduced conflicts with stakeholders, and corporate governance quality) reduce the earning forecast bias, while one CSR pathology (overinvestment) increases it. The intuition is therefore that good CSR may bring companies closer to unbiasedness and efficiency.

However, the presence of four factors makes the construction of the (good and bad CSR) groups rather complex. One possibility is to isolate one of the factors of interest (i.e. stakeholder risk) net of the other three by using a Fama and French (1993) approach.[19] However, given the

[19]That is, we may in principle divide the sample into six groups based on median thresholds of the four variables (i.e. first group: top 50% Accounting Opacity, top 50% Overinvestment, top 50% Net Corporate Governance,

combined impact of the four factors we can hardly expect the isolation of just one of them to produce the unbiasedness/efficiency results. As a consequence, we create top and bottom CSR portfolios based on the four factors jointly considered. We therefore build:

- a top CSR group for stocks which jointly respect the following four criteria: bottom 33% in terms of *Accounting Opacity*; bottom 33% in terms of *Stakeholder Risk*; bottom 33% in terms of *Overinvestment* and top 33% in terms of *Net Corporate Governance*;
- a bottom CSR group for stocks which jointly respect the following four criteria: top 33% in terms of *Accounting Opacity*; top 33% in terms of *Stakeholder Risk*; top 33% in terms of *Overinvestment* and bottom 33% in terms of *Net Corporate Governance*.

We run the unbiasedness Keane and Runkle (1998) test plus three combined unbiasedness and efficiency tests on the two above mentioned top and bottom 33 percent groups.
The four specifications are:

$$EPS_T^i = \alpha + \beta_1 E[EPS]_{T,h}^{i,j} + \varepsilon_T^i; \tag{3}$$

$$EPS_T^i = \alpha + \beta_1 E[EPS]_{T,h}^{i,j} + \beta_2 EPS_{T-1}^i + \varepsilon_T^i; \tag{4}$$

$$EPS_T^i = \alpha + \beta_1 E[EPS]_{T,h}^{i,j} + \beta_2 AFE_{T-1}^i + \varepsilon_T^i; \tag{5}$$

$$EPS_T^i = \alpha + \beta_1 E[EPS]_{T,h}^{i,j} + \beta_2 AFE_{T-1}^{i,j} + \varepsilon_T^i; \tag{6}$$

where $EPS_T^i$ is the earning per share of company $i$ released in the fiscal year T and $E[EPS]_{T,h}^{i,j}$ is the earning per share forecast formulated by analyst $j$ at the forecast horizon $h$ for company $i$ . In the second specification $EPS_{T-1}^i$ is the one-year lagged earning per share; in the third specification $AFE_{T-1}^i$ is the one-year lagged average firm forecast error; while in the fourth specification, $AFE_{T-1}^{i,j}$ is the one-year lagged average firm/analyst forecast error (that is, the average error made by the analyst $j$ on the firm $i$ in the previous year). The first specification tests unbiasedness, which implies that forecasted earnings must not be significantly different from released earnings. Hence, the joint null hypothesis here is $H_0$: $\alpha = 0$, $\beta_1 = 1$. In the other three tests we also test efficiency by verifying whether past information affects actual earnings. As well known, efficiency implies that past information must not affect the current forecast error. Hence the null hypothesis here is $H_0$: $\beta_2 = 0$.

**Insert Table 6.**

**Insert Table 7.**

The tests are run with standard errors clustered for year, industry, and broker house effects. In order to avoid the risk of residuals cross-correlation, we repeat the estimations by adding

top 50% Stakeholder Risk; second group: top 50% Accounting Opacity, bottom 50% Overinvestment, top 50% Net Corporate Governance, top 50% Stakeholder Risk, and so on).

broker house and industry dummies to the base specification (TEST 2 in Tables 6 and 7). Our findings clearly show that unbiasedness is markedly rejected for the bottom 33 percent CSR firms (Table 6), while it is accepted for the top 33 percent CSR firms (Table 7), that is, those leading in terms of accounting accuracy, corporate governance quality, lack of overinvestment and mitigation of stakeholder risk. More specifically, the coefficient of the earning forecast bias forecast is far from 1 in the bottom CSR group (between .25 and .45 in the tests with different specifications), while it is never significantly different from one in the top CSR group. The intercept is also closer to zero in the top than in the bottom CSR groups. Overall this leads to rejection of the joint hypothesis in all of the seven specifications for the bottom CSR portfolio. The joint hypothesis is on the contrary not rejected in five out of seven cases for the top CSR portfolio and, when it is rejected, this is just for a small deviation of the intercept from zero. Efficiency is not rejected for the top CSR portfolio in TEST 3 and 4, documenting that past information on earning per share is incorporated. It is however rejected for both the top and the bottom CSR portfolio in TEST 5 to 8, documenting that information from past earning forecast errors is not fully incorporated even in the top CSR portfolio.

### 3.3 Empirical findings on the standard deviation of the absolute forecast error

If CSR is expected to reduce some dimensions of risk and uncertainty, we should find an impact on the variability of forecasts similar to that found on the forecast error. Opacity in accounting practices, conflicts with stakeholders and overinvestment are in fact expected to increase the variability of forecasts across analysts, while quality of corporate governance is expected to reduce it. The estimated specification is:

$$\begin{aligned} AFESD^{i,j}_{T,h} &= \alpha + \beta_1 AccountingOpacity^{i}_{T-1} + \beta_2 NetCorporateGovernance^{i}_{T-1} + \\ &+ \beta_3 StakeholderRisk^{i}_{T-1} + \beta_4 Overinvetment^{i}_{T-1} + \textstyle\sum_{l=2}^{7} \beta_l X_l + \varepsilon^{i,j}_{T,h} \end{aligned} \quad (7)$$

where the dependent variable $AFESD^{i,j}_{T,h}$ is the standard deviation of the earning forecast error for company $i$ of analyst $j$ made for the fiscal year $T$ at the distance $h$ from the release date.

**Insert Table 8.**

As expected, the results on volatility go in the same direction as those of the absolute forecast error in Table 4. Also in this case we register a negative impact of the number of analysts and a positive effect of the number of forecasts. The impact of the four CSR factors is consistent with that on the absolute earning forecast error and with our ex ante hypotheses (Table 8, column 1 to column 2). Results are robust in the distance from release date split under both specifications with/without broker house fixed effects.

# 4 Conclusions

Corporate Social Responsibility has been generally considered in the literature to be somewhat unconventional with respect to the mainstream financial theory postulating maximization of shareholders' wealth and supporting the efficient market hypothesis. What we document with our research is that this perception is wrong. CSR can indeed bring markets closer to efficiency, since it significantly reduces the earning forecast error and the variability of analysts' forecasts. We however qualify how and in what terms CSR may improve forecasting accuracy bringing financial markets closer to efficiency and unbiasedness by identifying four main aspects of it (accounting accuracy, stakeholder risk mitigation, corporate governance quality, and overinvestment).

First, CSR includes adoption of more transparent accounting practices which reduce information asymmetries and, with them, both the variability and absolute value of the earning forecast error. Second, CSR involves mitigation of the controversies and conflicts with stakeholders which are an additional source of shocks that may affect corporate profitability, thereby increasing its variability. Third, one of the CSR domains is corporate governance. Good corporate governance is also positively related to earning forecasts predictability. Fourth, CSR may, however, become a domain of arbitrary behavior by managers who may be tempted to overinvest in it to maximize the personal goal of visibility and recognition. In this case CSR may increase the unpredictability of earnings.

Our findings confirm the hypotheses that accounting accuracy, stakeholder risk mitigation and corporate governance quality reduce the absolute earning forecast error and its standard error, while overinvestment increases them. In order to verify more closely the relationship between the four CSR aspects and earnings forecasting efficiency we perform unbiasedness and efficiency tests on the top 33 and the bottom 33 percent firms in terms of CSR quality (which we measured in terms of a combination of accounting accuracy, corporate governance quality, lack of overinvestment and stakeholder risk mitigation). We find that unbiasedness is generally not rejected for the first group while it is so for the second. Our findings make an original contribution to the controversy on the relationship between the earning forecast error and the efficient market hypothesis. Consistently with the Keane and Runkle (1998) conclusion that earning forecasts are unbiased once correcting for discretionary special charges, our results further qualify this point by showing that the four CSR-related factors play a crucial role in discriminating between biased and unbiased earning forecasts and may therefore become referents for investors on this issue.

## References


B. Ajinkya, Sanjeev Bhojraj, and Partha Sengupta. The association between outside directors, institutional investors and the properties of management earnings forecasts. *Journal of Accounting Research*, 43(3):343–376, 2005.

G. A. Akerlof. Labor contracts as partial gift exchange. *The Quarterly Journal of Economics*, 97(4):543–69, November 1982.

K. E. Aupperle, A. B. Carroll, and J. D. Hatfield. An empirical examination of the relationship between corporate social responsibility and profitability. *Academy of management review*, 28 (2):446–463, June 1985.

A. Barnea and A. Rubin. Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics*, 97(1):71–86, November 2010.

D. P. Baron, M. A. Harjoto, and H. Jo. The economics and politics of corporate social performance. Research Papers 1993, Stanford University, Graduate School of Business, July 2008.

R. Bauer, K. Koedijk, and R. Otten. International evidence on ethical mutual fund performance and investment style. *Journal of Banking and Finance*, 29(7):1751–1767, July 2005.

L. Becchetti and R. Ciciretti. Stock market reaction to the global financial crisis: testing for the lehman brothers'event. *Giornale degli Economisti*, 70(2):3–58, July 2011.

L. Becchetti, S. Di Giacomo, and D. Pinnacchio. Corporate social responsibility and corporate performance: evidence from a panel of us listed companies. *Applied Economics*, 40(5):541–567, 2008.

R. Benabou and J. Tirole. Individual and corporate social responsibility. *Economica*, 77(305): 1–19, 01 2010.

L. Boni and K. Womack. *Wall Street's Credibility Problem: Misaligned Incentives and Dubious Fixes?* The Brookings-Wharton Papers in Financial Services, 2002.

F. Boutin-Dufresne and P. Savaria. Corporate social responsibility and financial risk. *The Journal of Investing*, 13(1):57–68, Spring 2004.

L. D. Brown and L. Zhou. Interactions between analyst earnings forecasts and management earnings forecasts. SSRN: http://ssrn.com/abstract=2002345, August 2012.

L. D. Brown, G. D. Richardson, and S. J. Schwager. An information interpretation of financial analyst superiority in forecasting earnings. *Journal of Accounting Research*, 25(1):49–67, Spring 1987.

R. Carson, N. Flores, and N. Meade. Contingent valuation: Controversies and evidence. *Environmental and Resource Economics*, 19(2):173–210, June 2001.

P. Chaney, M. Faccio, and D. Parsley. The quality of accounting information in politically connected firms. *Journal of Accounting and Economics*, 51(1-2):58–76, 2011.

H. Y. Chung and J.B Kim. The use of multiple instruments for measurement of earnings forecast errors, firm size effect and the quality of analysts' forecast errors. *Journal of Business Finance and Accounting*, 21(5):707–727, 1994.

R. Ciciretti, Jr. G. P. Dwyer, and I. Hasan. Investment analysts' forecasts of earnings. *Review, Federal Reserve Bank of St. Louis*, pages 545–568, September 2009.

A. Crane, A. McWilliams, D. Matten, J. Moon, and D. S. Siegel, editors. *The Oxford Handbook of Corporate Social Responsibility*. Oxford University Press, August 2009.

A. Duru and D. M. Reeb. International diversification and analysts' forecast accuracy and bias. *The Accounting Review*, 77(2):415–433, April 2002.

E. F. Fama and R. K. French. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 1(33):3–56, 1993.

Directorate-General for Employment and Social Affairs. *Promoting a European framework for corporate social responsibility*, volume COM(2001) 366. The Green Paper. European Commission, 2001.

S. Fowler and C. Hope. A critical review of sustainable business indices and their impact. *Journal of Business Ethics*, 76(3):243–252, December 2007.

M. Freedman and B. Jaggi. Pollution performance of firms from pulp and paper industries. *Environmental Management*, 10:359–365, 1986.

E. Freeman. *Strategic management : a stakeholder approach*. Pitman, 1984.

B.S. Frey and F. Oberholzer-Gee. The cost of price incentives: An empirical analysis of motivation crowding-out. *American Economic Review*, 87(4):746–55, September 1997.

E. García-Meca and J.P. Sánchez-Ballesta. A meta-analysis approach upon the value relevance earnings. *Revista de Contabilidad - Spanish Accounting Review*, 9(18):31–59, 2006.

C. C. Geczy, R. F. Stambaugh, and D. Levin. Investing in Socially Responsible Mutual Funds. *SSRN Working Paper Series*, 2005.

A. Goss and G. S. Roberts. The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking and Finance*, 35(7):1794–1810, July 2011.

L. Hodgkinson. Analysts' forecasts and the broker relationship. *Journal of Business Finance and Accounting*, 28(7-8):943–961, 2001.

H. Jo and M. A. Harjoto. Why do firms engage in corporate social responsibility? *Working Paper Santa Clara University*, 2007.

H. Jo and M. A. Harjoto. Corporate governance and firm value: The impact of corporate social responsibility. *Journal of Business Ethics*, 103(3):351–383, October 2011.

M.P. Keane and D.E. Runkle. Are financial analysts' forecasts of corporate profits rational? *Journal of Political Economy*, 106(4):768–805, August 1998.

R. King, G. Pownall, and G. Waymire. Expectations adjustments via timely management forecasts: Review, synthesis and suggestions for future research. *Journal of Accounting Literature*, 9:113–144, 1990.

D.M. Kreps. Intrinsic motivation and extrinsic incentives. *American Economic Review*, 87(2): 359–64, May 1997.

M. H. Lang and R. J. Lundholm. Corporate disclosure policy and analyst behavior. *The Accounting Review*, 71(4):467–492, October 1996.

M. H. Lang, K. V. Lins, and D. P. Miller. Adrs, analysts, and accuracy: Does cross listing in the united states improve a firm's information environment and increase market value? *Journal of Accounting Research*, 41(2):317–345, May 2003.

T. Lim. Rationality and analysts' forecast bias. *The Journal of Finance*, 56(1):369–385, 2001.

T. Lys and L. G. Soo. Analysts' forecast precision as a response to competition. *Journal of Accounting, Auditing and Finance*, 10(4):751–763, 1995.

J.M. Malcomson. Unemployment and the efficiency wage hypothesis. *Economic Journal*, 91 (364):848–66, December 1981.

J.D. Margolis and J.P. Walsh. Misery Loves Companies: Rethinking Social Initiatives by Business. *Administrative Sciences Quarterly*, 48:268–305, June 2003.

A. McWilliams and D. Siegel. Corporate social responsibility: A theory of the firm perspective. *Academy of management review*, pages 117–127, 2001.

M. Minor. The decisions of the corporate special litigation committees: An empirical investigation. *Indiana Law Journal*, 84(4), 2009.

W.D. Nordhaus. Forecasting efficiency: Concepts and applications. *The Review of Economics and Statistics*, 69(4):667–74, November 1987.

P. C. O'Brien. Analysts' forecasts as earnings expectations. *Journal of Accounting and Economics*, 10(1):53 – 83, 1988.

L.E. Preston and D.P. O'Bannon. The corporate social-financial performance relationship. *Business and Society*, 36(4):419–429, 1997.

B. Ruf, K. Muralidhar, R. Brown, J. Janney, and K. Paul. An empirical investigation of the relationship between change in corporate social performance and financial performance: A stakeholder theory perspective. *Journal of Business Ethics*, 32:143–156, 2001.

R.M. Ryan, R. Koestner, and E.L. Deci. Ego-involved persistence: When free-choice behavior is not intrinsically motivated. *Motivation and Emotion*, 15:185–205, 1991.

S.C. Salop. Monopolistic competition with outside goods. *The Bell Journal of Economics*, pages 141–156, 1979.

J.P. Sanchez-Ballesta and E. Garcia-Meca. A meta-analytic vision of the effect of ownership structure on firm performance. *Corporate Governance: An International Review*, 15(5):879–892, 2007.

R. Shadbegian and W. Gray. Assessing multi-dimensional performance: environmental and economic outcomes. *Journal of Productivity Analysis*, 26(3):213–234, 2006.

C. Shapiro and J.E. Stiglitz. Equilibrium unemployment as a worker discipline device. *American Economic Review*, 74(3):433–44, June 1984.

R.G. Sloan. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review*, 71(3):289–315, 1996.

D. Vitaliano and G. Stella. The cost of corporate social responsibility: the case of the community reinvestment act. *Journal of Productivity Analysis*, 26(3):235–244, 2006.

D. Vogel. *The Market for Virtue: The Potential and Limits of Corporate Social Responsibility: The Potential and Limits of Corporate Social Responsibilty*. Brookings Institution, June 2005.

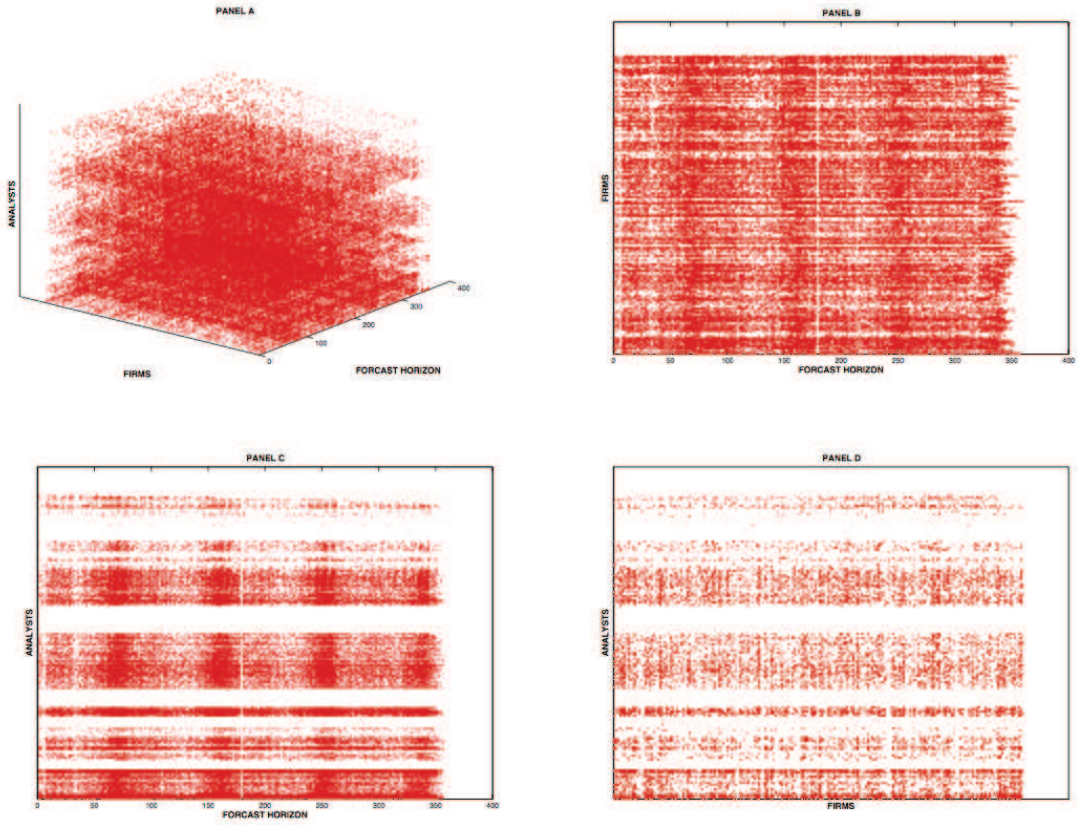


Figure 1: **Panel A**: three dimensions data overview by Analysts, Firms and Forecast Horizons; **Panel B**: two dimensions data overview by Firms and Forecast Horizons; **Panel C**: two dimensions data overview by Analysts and Forecast Horizons; **Panel D**: two dimensions data overview by Analysts and Firms.

Table 1: Summary Statistics for the aggregate CSR variables in KLD

| Variable | N | Min | Max | Mean | p50 | Sd | Kurtosis | Skewness | p1 | p5 | p25 | p75 | p95 | p99 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ALL YEARS** | | | | | | | | | | | | | | |
| Accounting Opacity | 616,790 | 0 | 2 | 0.07 | 0 | 0.25 | 13.82 | 3.54 | 0 | 0 | 0 | 0 | 1 | 1 |
| Net Corporate Governance | 616,790 | -4 | 2 | -0.33 | 0 | 0.72 | 3.47 | -0.31 | -2 | -1 | -1 | 0 | 1 | 1 |
| Stakeholder Risk | 616,790 | 0 | 9 | 0.92 | 0 | 1.38 | 7.02 | 1.93 | 0 | 0 | 0 | 1 | 4 | 6 |
| Overinvestment | 616,790 | 0 | 21 | 2.24 | 1 | 2.78 | 8.01 | 1.96 | 0 | 0 | 0 | 3 | 8 | 12 |

**Legend**: **AccountingOpacity** is the sum of CGOV-con-I and CGOV-con-X. **StakeholderRisk** is the sum of COM-con-A, COM-con-B, COM-con-C, COM-con-D, COM-con-X, DIV-con-A, DIV-con-X, EMP-con-B, EMP-con-X, ENV-con-X, HUM-con-D, HUM-con-F, HUM-con-G, HUM-con-X, PRO-con-A, PRO-con-D, PRO-con-E, PRO-con-X. **NetCorporateGovernance** is the difference between the corporate governance strengths (CGOV-str-A, CGOV-str-C, CGOV-str-D, CGOV-str-E, CGOV-str-F, CGOV-str-X) and the corporate governance concerns (CGOV-con-B, CGOV-con-F, CGOV-con-G, CGOV-con-H, CGOV-con-I, CGOV-con-J, CGOV-con-K, CGOV-con-X).
**Overinvestment** is the sum of COM-str-A, COM-str-B, COM-str-C, COM-str-D, COM-str-F, COM-str-G, COM-str-H, COM-str-X, DIV-str-A, DIV-str-B, DIV-str-C, DIV-str-D, DIV-str-E, DIV-str-F, DIV-str-G, DIV-str-H, DIV-str-X, EMP-str-A, EMP-str-B, EMP-str-C, EMP-str-D, EMP-str-F, EMP-str-G, EMP-str-H, EMP-str-X, ENV-str-A, ENV-str-B, ENV-str-C, ENV-str-D, ENV-str-F, ENV-str-G, ENV-str-X, HUM-str-A, HUM-str-D, HUM-str-G, HUM-str-X, PRO-str-A, PRO-str-B, PRO-str-C, PRO-str-D, PRO-str-X. Details on the attribution of strengths and concerns scores are provided in Appendix A.

Table 2: Summary Statistics for the I/B/E/S variables

| Variable | N | Min | Max | Mean | p50 | Sd | Kurtosis | Skewness | p1 | p5 | p25 | p75 | p95 | p99 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **All Sample** | | | | | | | | | | | | | | |
| $EPS$ | 616,790 | -56.63 | 66.42 | 1.85 | 1.49 | 2.79 | 61.39 | 1.25 | -3.90 | -1 | 0.65 | 2.73 | 5.88 | 10.34 |
| $E[EPS]$ | 616,790 | -58 | 67.32 | 1.96 | 1.53 | 2.52 | 52.12 | 3.65 | -2.64 | -0.62 | 0.71 | 2.75 | 5.75 | 10.24 |
| $P_{T-1}$ | 616,790 | 0.70 | 1916 | 34.86 | 25.13 | 59.77 | 280.56 | 14.07 | 3.10 | 6.41 | 14.98 | 40.13 | 77.26 | 191.50 |
| $AFE$ | 616,790 | 0 | 12.49 | 0.02 | 0.01 | 0.09 | 2,421.55 | 33.65 | 0 | 0 | 0 | 0.02 | 0.07 | 0.24 |
| $AFESD$ | 616,790 | 0 | 4.46 | 0.01 | 0.01 | 0.04 | 2,973.94 | 34.33 | 0 | 0 | 0 | 0.01 | 0.04 | 0.13 |
| Forecast Horizon | 616,790 | 1 | 364 | 177.89 | 165 | 97.24 | 1.78 | 0.07 | 11 | 37 | 81 | 255 | 334 | 344 |
| Number of Analysts | 616,790 | 1 | 223 | 66.83 | 58 | 48.20 | 3.33 | 0.92 | 5 | 10 | 27 | 94 | 168 | 200 |
| Number of Forecasts | 616,790 | 1 | 5,003 | 1,157.75 | 847 | 1,051.66 | 5.19 | 1.49 | 34 | 100 | 366 | 1,669 | 3,328 | 4,732 |
| Log(total Asset) | 616,790 | 0.69 | 20.74 | 15.27 | 15.29 | 1.82 | 3.29 | -0.15 | 11.27 | 12.14 | 14.03 | 16.56 | 18.17 | 19.45 |
| **Distance from release date: 181-364 days** | | | | | | | | | | | | | | |
| $EPS$ | 282,011 | -56.63 | 66.42 | 1.82 | 1.47 | 2.82 | 65.39 | 1.13 | -3.94 | -1.04 | 0.63 | 2.70 | 5.75 | 10.39 |
| $E[EPS]$ | 282,011 | -47.50 | 66.43 | 1.97 | 1.54 | 2.47 | 58.60 | 4.13 | -2.34 | -0.52 | 0.73 | 2.72 | 5.60 | 10.26 |
| $P_{T-1}$ | 282,011 | 0.70 | 1,916 | 34.57 | 24.96 | 58.21 | 275.93 | 13.80 | 3.09 | 6.34 | 14.90 | 39.94 | 76.58 | 192.79 |
| $AFE$ | 282,011 | 0 | 12.49 | 0.03 | 0.01 | 0.11 | 1,842.71 | 29.50 | 0 | 0 | 0 | 0.02 | 0.10 | 0.32 |
| $AFESD$ | 282,011 | 0 | 4.46 | 0.01 | 0.01 | 0.04 | 2,828.39 | 33.63 | 0 | 0 | 0 | 0.01 | 0.04 | 0.14 |
| Forecast Horizon | 282,011 | 181 | 364 | 270.31 | 260 | 45.63 | 1.97 | 0.03 | 183 | 194 | 240 | 313 | 340 | 347 |
| Number of Analysts | 282,011 | 1 | 223 | 67.47 | 58 | 48.45 | 3.30 | 0.91 | 5 | 10 | 28 | 94 | 172 | 200 |
| Number of Forecasts | 282,011 | 1 | 5,003 | 1,166.70 | 853 | 1,056.05 | 5.13 | 1.47 | 35 | 100 | 368 | 1,689 | 3,328 | 4,732 |
| Log(total Asset) | 282,011 | 2.64 | 20.63 | 15.28 | 15.31 | 1.82 | 3.19 | -0.15 | 11.29 | 12.13 | 14.04 | 16.56 | 18.15 | 19.44 |
| **Distance from release date: below 180 days** | | | | | | | | | | | | | | |
| $EPS$ | 334,779 | -56.63 | 66.42 | 1.87 | 1.51 | 2.75 | 57.58 | 1.35 | -3.86 | -0.98 | 0.66 | 2.76 | 5.90 | 10.10 |
| $E[EPS]$ | 334,779 | -58 | 67.32 | 1.95 | 1.52 | 2.56 | 47.26 | 3.28 | -2.90 | -0.70 | 0.69 | 2.76 | 5.88 | 10.22 |
| $P_{T-1}$ | 334,779 | 0.70 | 1916 | 35.10 | 25.30 | 61.05 | 282.70 | 14.25 | 3.10 | 6.44 | 15.01 | 40.31 | 77.65 | 191.50 |
| $AFE$ | 334,779 | 0 | 10.73 | 0.01 | 0.01 | 0.07 | 3,197.01 | 38.69 | 0 | 0 | 0 | 0.01 | 0.05 | 0.16 |
| $AFESD$ | 334,779 | 0 | 4.46 | 0.01 | 0.01 | 0.04 | 3,108.77 | 34.94 | 0 | 0 | 0 | 0.01 | 0.04 | 0.13 |
| Forecast Horizon | 334,779 | 1 | 180 | 100.04 | 88 | 49.08 | 1.71 | 0.01 | 8 | 20 | 63 | 152 | 169 | 177 |
| Number of Analysts | 334,779 | 1 | 223 | 66.29 | 57 | 47.98 | 3.36 | 0.93 | 5 | 10 | 27 | 93 | 168 | 200 |
| Number of Forecasts | 334,779 | 1 | 5,003 | 1,150.21 | 835 | 1,047.90 | 5.25 | 1.50 | 34 | 100 | 365 | 1,609 | 3,328 | 4,732 |
| Log(total Asset) | 334,779 | 0.69 | 20.74 | 15.27 | 15.28 | 1.83 | 3.37 | -0.15 | 11.26 | 12.14 | 14.03 | 16.55 | 18.20 | 19.49 |

**Legend**: **E[EPS]**: forecasted earning per share; **EPS**: released earning per share; $\mathbf{P}_{t-1}$: previous year share price; **AFE**: absolute difference between the forecasted earning per share and the released earning per share scaled by the end of the previous year share price; **AFESD**: standard deviation of the earning forecast error; **Number of Analysts**: number of analysts producing forecasts for a given firm; **Number of Forecasts**: number of forecasts computed by analysts on a given firm; **Forecast Horizon**: distance from the release date; **Log(Total Asset)**: logarithm of total asset.

Table 3: Summary Statistics for high and low CSR subsamples for Accounting, Net Corporate Governance, Core Risk Mitigation, and Over Investment.

| **Variable** | **N** | **Min** | **Max** | **Mean** | **p50** | **Sd** | **Kurtosis** | **Skewness** | **p1** | **p5** | **p25** | **p75** | **p95** | **p99** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Panel A: **High CSR Firms** | | | | | | | | | | | | | | |
| $EPS$ | 115,352 | -56.63 | 66.42 | 1 | 0.96 | 2.57 | 210.25 | 1.90 | -4.43 | -1.56 | 0.29 | 1.73 | 3.72 | 6.06 |
| $E[EPS]$ | 115,352 | -47.50 | 67.32 | 1.12 | 0.98 | 2.14 | 215.24 | 8.04 | -3.25 | -1.25 | 0.35 | 1.75 | 3.70 | 6.19 |
| $P_{T-1}$ | 115,352 | 0.70 | 1916 | 25.15 | 19.41 | 49.21 | 723.94 | 23.84 | 2.76 | 5.22 | 12.24 | 29.02 | 50.88 | 112.13 |
| $AFE$ | 115,352 | 0 | 6.21 | 0.02 | 0.01 | 0.11 | 1361.76 | 32.30 | 0 | 0 | 0 | 0.02 | 0.07 | 0.22 |
| $AFESD$ | 115,317 | 0 | 3.77 | 0.01 | 0.01 | 0.03 | 3930.68 | 42.97 | 0 | 0 | 0 | 0.01 | 0.04 | 0.11 |
| Forecast Horizon | 115,352 | 1 | 364 | 176.21 | 162 | 96.38 | 1.77 | 0.09 | 11 | 43 | 78 | 252 | 331 | 341 |
| Number of Analysts | 115,352 | 1 | 223 | 29.86 | 22 | 24.78 | 9.92 | 2.12 | 3 | 6 | 13 | 37 | 83 | 116 |
| Number of Forecasts | 115,352 | 1 | 3,721 | 426.45 | 293 | 428.05 | 13.61 | 2.65 | 16 | 44 | 149 | 552 | 1,305 | 2,190 |
| Log(Total Asset) | 115,352 | 0.69 | 18.82 | 13.73 | 13.67 | 1.42 | 3.34 | 0.18 | 10.80 | 11.50 | 12.70 | 14.74 | 16.07 | 17.36 |
| Panel B: **Low CSR Firms** | | | | | | | | | | | | | | |
| $EPS$ | 20,490 | -10.73 | 13.44 | 2.73 | 1.91 | 2.61 | 9.11 | 0.14 | -0.55 | 0.07 | 1.22 | 3.97 | 7.06 | 11.52 |
| $E[EPS]$ | 20,490 | -7.47 | 51.52 | 2.89 | 2.14 | 2.45 | 13.61 | 1.75 | -1.46 | 0.20 | 1.31 | 4.22 | 7 | 11.81 |
| $P_{T-1}$ | 20,490 | 2.29 | 180 | 44.60 | 37.21 | 29.90 | 5.93 | 1.38 | 6.37 | 8.45 | 22.50 | 65.26 | 93.10 | 146.76 |
| $AFE$ | 20,490 | 0 | 1.92 | 0.02 | 0.01 | 0.07 | 295.94 | 15.30 | 0 | 0 | 0 | 0.01 | 0.06 | 0.19 |
| $AFESD$ | 20,490 | 0 | 0.45 | 0.01 | 0.01 | 0.03 | 147.70 | 11.30 | 0 | 0 | 0 | 0.01 | 0.03 | 0.09 |
| Forecast Horizon | 20,490 | 1 | 356 | 179.09 | 165 | 98.39 | 1.77 | 0.09 | 12 | 36 | 80 | 256 | 337 | 346 |
| Number of Analysts | 20,490 | 10 | 200 | 112.30 | 111 | 40.95 | 2.94 | 0.12 | 18 | 51 | 86 | 136 | 186 | 200 |
| Number of Forecasts | 20,490 | 36 | 3,405 | 1,877.72 | 1,866 | 834.32 | 2.14 | 0.07 | 154 | 632 | 1191 | 2,435 | 3,328 | 3,405 |
| Log(Total Asset) | 20,490 | 14.32 | 20.55 | 17.25 | 17.13 | 1.13 | 4.36 | 0.62 | 14.43 | 15.65 | 16.59 | 17.63 | 19.43 | 20.50 |

**Legend**: **High CSR firms**: bottom 33% percentile in terms of CSR scores in Accounting Opacity, Stakeholder Risk, Over Investment, and top 33% in terms of Net Corporate Governance. **Low CSR firms**: top 33% percentile in terms of CSR scores in Accounting Opacity, Stakeholder Risk, Overinvestment, and bottom 33% in terms of Net Corporate Governance. For variable details: see Table (2).

Table 4: The impact of CSR variables on the absolute earning forecast error (AFE)

| | **(1)** | **(1A)** | **(1B)** | **(2)** | **(2A)** | **(2B)** |
|---|---|---|---|---|---|---|
| Accounting Opacity | 0.00566*** | 0.00770*** | 0.00377*** | 0.00568*** | 0.00798*** | 0.00371*** |
| | (0.00063) | (0.00112) | (0.00065) | (0.00064) | (0.00114) | (0.00066) |
| Net Corporate Governance | -0.00142*** | -0.00149*** | -0.00137*** | -0.00141*** | -0.00145*** | -0.00139*** |
| | (0.0002) | (0.00036) | (0.00022) | (0.00021) | (0.00037) | (0.00022) |
| Stakeholder Risk | 0.00051*** | 0.00105*** | 0.00050*** | 0.00050*** | 0.00103*** | -0.00001 |
| | (0.00012) | (0.00022) | (0.00013) | (0.00012) | (0.00022) | (0.00013) |
| Overinvestment | 0.00147*** | 0.00192*** | 0.00108*** | 0.00146*** | 0.00189*** | 0.00108*** |
| | (0.00007) | (0.00011) | (0.00008) | (0.00007) | (0.00012) | (0.00008) |
| Forecast Horizon | 0.00008*** | 0.00005*** | 0.00008*** | 0.00008*** | 0.00005*** | 0.00008*** |
| | (0.00000) | (0.00001) | (0.00000) | (0.00000) | (0.00001) | (0.00000) |
| Number of Analysts | -0.00020*** | -0.00028*** | -0.00012*** | -0.00019*** | -0.00027*** | -0.00012*** |
| | (0.00001) | (0.00001) | (0.00001) | (0.00001) | (0.00001) | (0.00001) |
| Number of Forecasts | 0.00001*** | 0.00001*** | 0.00000*** | 0.00001*** | 0.00001*** | 0.00000*** |
| | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| Log(Total Asset) | -0.00231*** | -0.00334*** | -0.00143*** | -0.00241*** | -0.00349*** | -0.00152*** |
| | (0.00016) | (0.00028) | (0.00016) | (0.00016) | (0.00029) | (0.00017) |
| Constant | 0.05244*** | 0.07523*** | 0.04079*** | 0.05327*** | 0.07547*** | 0.04212*** |
| | (0.00333) | (0.00622) | (0.00348) | (0.00353) | (0.00657) | (0.0037) |
| Industry Fixed Effects | YES | YES | YES | YES | YES | YES |
| Broker House Fixed Effects | - | - | - | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES | YES | YES |
| Observations | 616,790 | 282,011 | 334,779 | 616,790 | 282,011 | 334,779 |
| RMSE | 0.15 | 0.19 | 0.09 | 0.15 | 0.19 | 0.09 |
| $R^2$ | 0.41 | 0.50 | 0.26 | 0.41 | 0.50 | 0.26 |

**Legend**: for **Accounting Opacity**, **Net Corporate Governance**, **Stakeholder Risk**, and **Overinvestment** see Table (1); **Number of Analysts**: number of analysts producing forecasts for a given firm; **Number of Forecasts**: number of forecasts computed by analysts on a given firm; **Forecast Horizon**: distance from the release date; **Log(Total Asset)**: logarithm of total assets. **Industry** Fixed Effects: 4-digit industry dummies; **BrokerHouse** Fixed Effects: broker identification dummies; **Year** Fixed Effects: years dummies. **1A**: column (1) specification estimate limited to the subsample of forecasts between 181-364 days before the release date; **1B**: column (1) specification estimate limited to the subsample of forecasts formulated below 181 days before the release date. * $p$-value $< 0.05$, ** $p$-value $< 0.01$, *** $p$-value $< 0.001$; (Standard Errors).

Table 5: The impact of CSR variables on the absolute earning forecast error (AFE) (specification with lagged variables)

| | **(1)** | **(1A)** | **(1B)** | **(2)** | **(2A)** | **(2B)** |
|---|---|---|---|---|---|---|
| Accounting Opacity | 0.00473*** | 0.00711*** | 0.00259*** | 0.00460*** | 0.00698*** | 0.00250** |
| | (0.00078) | (0.00136) | (0.00077) | (0.00078) | (0.00136) | (0.00078) |
| Net Corporate Governance | -0.00018 | 0.00028 | -0.00059* | -0.00026 | 0.00019 | -0.00065* |
| | 0.00024 | 0.00041 | (0.00026) | 0.00024 | 0.00041 | (0.00026) |
| Stakeholder Risk | 0.00047** | 0.00104*** | -0.00010 | 0.00046** | 0.00100*** | -0.00008 |
| | (0.00015) | (0.00025) | 0.00016 | (0.00015) | (0.00025) | (0.00016) |
| Overinvestment | 0.00070*** | 0.00098*** | 0.00043*** | 0.00071*** | 0.00099*** | 0.00044*** |
| | (0.00007) | (0.00012) | (0.00009) | (0.00007) | (0.00012) | (0.00009) |
| $AFE^{i}_{T-1}$ | 0.17796*** | 0.27608** | 0.05334 | 0.17889*** | 0.27742** | 0.05392 |
| | (0.05366) | (0.09117) | (0.03873) | (0.05384) | (0.09167) | (0.03885) |
| $AFE^{i,j}_{T-1}$ | 0.20624*** | 0.24413** | 0.21389*** | 0.20467*** | 0.24197** | 0.21276*** |
| | (0.05291) | (0.09193) | (0.04292) | (0.0531) | (0.09243) | (0.04304) |
| Forecast Horizon | 0.00008*** | 0.00005*** | 0.00007*** | 0.00008*** | 0.00005*** | 0.00007*** |
| | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| Number of Analysts | -0.00010*** | -0.00016*** | -0.00004*** | -0.00010*** | -0.00015*** | -0.00004*** |
| | (0.00001) | (0.00002) | (0.00001) | (0.00001) | (0.00002) | (0.00001) |
| Number of Forecasts | 0.00000*** | 0.00000*** | 0.00000 | 0.00000*** | 0.00000*** | 0.00000 |
| | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| Log(Total Asset) | -0.00173*** | -0.00258*** | -0.00086*** | -0.00172*** | -0.00254*** | -0.00088*** |
| | (0.00019) | (0.00032) | (0.0002) | (0.00019) | ( 0.00033 ) | ( 0.00020 ) |
| Constant | 0.02040*** | 0.03743*** | 0.01137*** | 0.02192*** | 0.03723*** | 0.01328*** |
| | (0.00338) | (0.00626) | (0.00342) | (0.00366) | (0.00679) | (0.00346) |
| Industry Fixed Effects | YES | YES | YES | YES | YES | YES |
| Broker House Fixed Effects | - | - | - | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES | YES | YES |
| Observations | 427,736 | 206,649 | 221,087 | 427,736 | 206,649 | 221,087 |
| RMSE | 0.09 | 0.11 | 0.07 | 0.09 | 0.11 | 0.07 |
| $R^2$ | 0.11 | 0.14 | 0.09 | 0.12 | 0.14 | 0.10 |

**Legend**: for **Accounting Opacity**, **Net Corporate Governance**, **Stakeholder Risk**, and **Overinvestment** see Table (1); $\mathbf{AFE}^{i}_{T-1}$: one-year lagged average firm forecast error; $\mathbf{AFE}^{i,j}_{T-1}$: one-year lagged average firm/analyst forecast error; **Number of Analysts**: number of analysts per firm; **Number of Forecasts**: number of forecasts computed by analyst on a given firm; **Forecast Horizon**: distance from release date; **Log(Total Asset)**: logarithm of total asset. **Industry** Fixed Effects: 4-digit industry dummies; **BrokerHouse** Fixed Effects: broker identification dummies; **Year** Fixed Effects: years dummies. **1A**: column (1) specification estimate limited to the subsample of forecasts between 181-364 days before the release date; **1B**: column (1) specification estimate limited to the subsample of forecasts formulated below 181 days before the release date. * $p$-value $< 0.05$, ** $p$-value $< 0.01$, *** $p$-value $< 0.001$; (Standard Errors).

Table 6: Unbiasedness and Efficiency Test for Bottom 33% CSR Firms

| **TEST** | $\boldsymbol{\alpha}$ | $\boldsymbol{\beta_1}$ | $\boldsymbol{\beta_2}$ | $[\boldsymbol{\alpha}=0,\boldsymbol{\beta_1}=1]$ | $[\boldsymbol{\alpha}=0]$ | $[\boldsymbol{\beta_1}=1]$ | $[\boldsymbol{\beta_2}=0]$ | **Regressors** | **Controls** |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.0398*** | 0.4622*** | | 23.38*** | 46.65*** | 44.77*** | | 1, $E[EPS]^{i,j}_{T,h}$ | NO |
| | (0.0058) | (0.0803) | | | | | | | |
| 2 | -0.0352*** | 0.3372*** | | 140.42*** | 15.22*** | 160.48*** | | 1, $E[EPS]^{i,j}_{T,h}$ | YES |
| | (0.0090) | (0.0523) | | | | | | | |
| 3 | 0.0389*** | 0.4405*** | 0.0349 | 24.77*** | 49.52*** | 40.70*** | 0.99 | 1, $E[EPS]^{i,j}_{T,h}$, $EPS^{i}_{T-1}$ | NO |
| | (0.0055) | (0.0876) | (0.0351) | | | | | | |
| 4 | -0.0362*** | 0.3353*** | 0.0061 | 103.12*** | 18.55*** | 133.64*** | 0.04 | 1, $E[EPS]^{i,j}_{T,h}$, $EPS^{i}_{T-1}$ | YES |
| | (0.0084) | (0.0574) | (0.0322) | | | | | | |
| 5 | 0.0357*** | 0.4558*** | 0.1833*** | 29.39*** | 55.14*** | 58.38*** | 32.99*** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i}_{T-1}$ | NO |
| | (0.0048) | (0.0712) | (0.0327) | | | | | | |
| 6 | -0.0324*** | 0.2916*** | 0.1489*** | 149.48*** | 13.68*** | 185.02*** | 18.69*** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i}_{T-1}$ | YES |
| | (0.0087) | (0.0520) | (0.0344) | | | | | | |
| 7 | 0.0385*** | 0.4143*** | 0.2025*** | 36.65*** | 66.34*** | 72.50*** | 26.75*** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i,j}_{T-1}$ | NO |
| | (0.0047) | (0.0687) | (0.0391) | | | | | | |
| 8 | 0.0018 | 0.2539*** | 0.1448*** | 125.64*** | 0.06 | 241.97*** | 10.71*** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i,j}_{T-1}$ | YES |
| | (0.0073) | (0.0479) | (0.0442) | | | | | | |

**Legend**: $[\boldsymbol{\alpha}=0,\boldsymbol{\beta_1}=1]$, $[\boldsymbol{\alpha}=0]$ and $[\boldsymbol{\beta_1}=1]$ are the null hypotheses for the Unbiasedness Test. $[\boldsymbol{\beta_2}=0]$ is the null hypothesis for the Efficiency Test. Dependent variable: $\mathbf{EPS}^{i}_{T}$: earning per share of company $i$ released in the fiscal year T; $\mathbf{E}[\mathbf{EPS}]^{i,j}_{T,h}$: earning per share forecast formulated by analyst $j$ at the forecast horizon $h$ for the same company; $\mathbf{EPS}^{i}_{T-1}$: one-year lagged earning per share of company $i$; $\mathbf{AFE}^{i}_{T-1,h}$: the average one-year lagged firm forecast error; $\mathbf{AFE}^{i,j}_{T-1,h}$: the average one-year lagged firm/analyst forecast error. Controls are Industry, Year, Analyst. For variable details: see Table (3). * $p$-value $< 0.05$, ** $p$-value $< 0.01$, *** $p$-value $< 0.001$; (Standard Errors).

Table 7: Unbiasedness and Efficiency Test for Top 33 % CSR Firms

| **TEST** | $\boldsymbol{\alpha}$ | $\boldsymbol{\beta_1}$ | $\boldsymbol{\beta_2}$ | $[\boldsymbol{\alpha}=0,\boldsymbol{\beta_1}=1]$ | $[\boldsymbol{\alpha}=0]$ | $[\boldsymbol{\beta_1}=1]$ | $[\boldsymbol{\beta_2}=0]$ | **Regressors** | **Controls** |
|---|---|---|---|---|---|---|---|---|---|
| 1 | -0.0077*** | 1.0480*** | | 29.22*** | 14.31*** | 1.82 | | 1, $E[EPS]^{i,j}_{T,h}$ | NO |
| | (0.0020) | (0.0356) | | | | | | | |
| 2 | 0.0109 | 1.0564*** | | 0.90 | 0.00 | 1.79 | | 1, $E[EPS]^{i,j}_{T,h}$ | YES |
| | (116.1681) | (0.0421) | | | | | | | |
| 3 | -0.0109*** | 1.0606*** | 0.0436 | 15.13*** | 16.11*** | 0.35 | 0.43 | 1, $E[EPS]^{i,j}_{T,h}$, $EPS^{i}_{T-1}$ | NO |
| | (0.0027) | (0.1021) | (0.0664) | | | | | | |
| 4 | -0.0218 | 1.0619*** | 0.0695 | 0.16 | 0.00 | 0.32 | 0.98 | 1, $E[EPS]^{i,j}_{T,h}$, $EPS^{i}_{T-1}$ | YES |
| | (-) | (0.1091) | (0.0703) | | | | | | |
| 5 | -0.0049 | 1.0909*** | -0.0300** | 1.58 | 2.35 | 3.11* | 5.51** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i}_{T-1}$ | NO |
| | (0.0032) | (0.0516) | (0.1278) | | | | | | |
| 6 | -0.0180 | 1.1089*** | -0.3648** | 1.61 | 0.00 | 3.22* | 6.26** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i}_{T-1}$ | YES |
| | (223.5087) | (0.0606) | (0.1458) | | | | | | |
| 7 | -0.0059 | 1.0900*** | -0.2550** | 1.56 | 2.71 | 1.68 | 6.38** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i,j}_{T-1}$ | NO |
| | (0.0036) | (0.0694) | (0.1009) | | | | | | |
| 8 | -0.0489 | 1.1066*** | -0.3546*** | 1.77 | 3.33 | 1.63 | 9.41*** | 1, $E[EPS]^{i,j}_{T,h}$, $AFE^{i,j}_{T-1}$ | YES |
| | (0.0268) | (0.0835) | (0.1156) | | | | | | |

**Legend**: $[\boldsymbol{\alpha}=0,\boldsymbol{\beta_1}=1]$, $[\boldsymbol{\alpha}=0]$ and $[\boldsymbol{\beta_1}=1]$ are the null hypotheses for the Unbiasedness Test. $[\boldsymbol{\beta_2}=0]$ is the null hypothesis for the Efficiency Test. Dependent variable: $\mathbf{EPS}^{i}_{T}$, earning per share of company $i$ released in the fiscal year T; $\mathbf{E}[\mathbf{EPS}]^{i,j}_{T,h}$: earning per share forecast formulated by analyst $j$ at the forecast horizon $h$ for the same company; $\mathbf{EPS}^{i}_{T-1}$: one-year lagged earning per share of company $i$; $\mathbf{AFE}^{i}_{T-1,h}$: one-year lagged average firm forecast error; $\mathbf{AFE}^{i,j}_{T-1,h}$: one-year lagged average firm/analyst forecast error. Controls are Industry, Year, Analyst. For variable details: see Table (3). * $p$-value $< 0.05$, ** $p$-value $< 0.01$, *** $p$-value $< 0.001$; (Standard Errors).

Table 8: The impact of CSR variables on the standard deviation of AFE

| | **(1)** | **(1A)** | **(1B)** | **(2)** | **(2A)** | **(2B)** |
|---|---|---|---|---|---|---|
| Accounting Opacity | 0.00211*** | 0.00204*** | 0.00213*** | 0.00214*** | 0.00206*** | 0.00217*** |
| | (0.00021) | (0.00032) | (0.00029) | (0.00021) | (0.00032) | (0.00029) |
| Net Corporate Governance | -0.00073*** | -0.00077*** | -0.00071*** | -0.00070*** | -0.00074*** | -0.00067*** |
| | (0.00009) | (0.00014) | (0.00012) | (0.00009) | (0.00014) | (0.00012) |
| Stakeholder Risk | 0.00083*** | 0.00074*** | 0.00091*** | 0.00081*** | 0.00072*** | 0.00089*** |
| | (0.00005) | (0.00008) | (0.00007) | (0.00005) | (0.00008) | (0.00007) |
| Overinvestment | 0.00065*** | 0.00068*** | 0.00062*** | 0.00065*** | 0.00068*** | 0.00062*** |
| | (0.00003) | (0.00004) | (0.00004) | (0.00003) | (0.00004) | (0.00004) |
| Forecast Horizon | 0.00000 | -0.00001*** | 0.00000 | 0.00000 | -0.00001*** | 0.00000 |
| | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| Number of Analysts | -0.00014*** | -0.00013*** | -0.00015*** | -0.00014*** | -0.00013*** | -0.00014*** |
| | (0.00000) | (0.00001) | (0.00000) | (0.00000) | (0.00001) | (0.00000) |
| Number of Forecasts | 0.00000*** | 0.00000*** | 0.00001*** | 0.00000*** | 0.00000*** | 0.00000*** |
| | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| Log(Total Asset) | -0.00123*** | -0.00141*** | -0.00108*** | -0.00130*** | -0.00149*** | -0.00115*** |
| | (0.00006) | (0.00009) | (0.00008) | (0.00006) | (0.0001) | (0.00008) |
| Constant | 0.03246*** | 0.03774*** | 0.03058*** | 0.03335*** | 0.03810*** | 0.03199*** |
| | (0.00137) | (0.00204) | (0.00191) | (0.00148) | (0.00216) | (0.00209) |
| Industry Fixed Effects | YES | YES | YES | YES | YES | YES |
| Broker House Fixed Effects | - | - | - | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES | YES | YES |
| Observations | 616,720 | 281,986 | 334,734 | 616,720 | 281,986 | 334,734 |
| RMSE | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| $R^2$ | 0.92 | 0.94 | 0.89 | 0.92 | 0.94 | 0.89 |

**Legend**: for variables details see Table (1) and Table (4).

# Appendix A: Criteria of RiskMetrics-KLD social ratings

## SOCIAL ISSUE RATINGS [20]

**COMMUNITY** STRENGTHS:

**Charitable Giving** (COM-str-A). The company has consistently given over 1.5% of trailing three-year net earnings before taxes (NEBT) to charity, or has otherwise been notably generous in its giving [In 2002, KLD renamed the Generous Giving Strength as Charitable Giving]. **Innovative Giving** (COM-str-B). The company has a notably innovative giving program that supports nonprofit organizations, particularly those promoting self sufficiency among the economically disadvantaged. Companies that permit nontraditional federated charitable giving drives in the workplace are often noted in this section as well. **Support for Housing** (COM-str-C). The company is a prominent participant in public/private partnerships that support housing initiatives for the economically disadvantaged, e.g., the National Equity Fund or the Enterprise Foundation. **Support for Education** (COM-str-D).The company has either been notably innovative in its support for primary or secondary school education, particularly for those programs that benefit the economically disadvantaged, or the company has prominently supported job-training programs for youth.**Indigenous People Relations** (COM-str-E). The company has established relations with indigenous people in the areas of its proposed or current operations that respect the sovereignty, land, culture, human rights, and intellectual property of the indigenous people [added in 2000; in 2002 moved into the Human Rights area].**Non-US Charitable Giving** (COM-str-F). The company has made a substantial effort to make charitable contributions abroad, as well as in the U.S. To qualify, a company must make at least 20% of its giving, or have taken notably innovative initiatives in its giving program, outside the U.S. **Volunteer Programs** (COM-str-G).The company has an exceptionally strong volunteer program [added in 2005 ]. **Other Strength**(COM-str-X). The company has either an exceptionally strong in-kind giving program, or engages in other notably positive community activities.

**COMMUNITY** CONCERNS:

**Investment Controversies** (COM-con-A). The company is a financial institution whose lending or investment practices have led to controversies, particularly ones related to the Community Reinvestment Act. **Negative Economic Impact** (COM-con-B). The company's actions have resulted in major controversies concerning its economic impact on the community. These controversies can include issues related to environmental contamination, water rights disputes, plant closings, "put-or-pay" contracts with trash incinerators, or other company actions that adversely affect the quality of life, tax base, or property values in the community. **Indigenous People Relations** (COM-con-C). The company has been involved in serious controversies with indigenous people that indicate the company has not respected the sovereignty, land, culture, human rights, and intellectual property of the indigenous people [added in 2000; in 2002 moved into the Human Rights area]. **Disputes** (COM-con-D). The company has recently been involved in major tax disputes involving Federal, state, local or non-U.S. government authorities, or is involved in controversies over its tax obligations to the community [entered in 1991; in 2005 moved into the Community area].**Other Concern** (COM-con-X). The company is involved with a controversy that has mobilized community opposition, or is engaged in other noteworthy community controversies.

**CORPORATE GOVERNANCE** STRENGTHS:

**Limited Compensation**(CGOV-str-A). The company has recently awarded notably low levels of compensation to its top management or its board members. The limit for a rating is total compensation of less than $\$500,000$ per year for a CEO or $\$30,000$ per year for outside directors. **Ownership Strength**(CGOV-str-C). The company owns between 20% and 50% of another company KLD has cited as having an area of social strength, or is more than 20% owned by a firm that KLD has rated as having social strengths. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first. **Transparency Strength**(CGOV-str-D). The company is particularly effective in reporting on a wide range of social and environmental performance measures, or is exceptional in reporting on one particular measure [added in 2006; this strength incorporates information from the former Environment: Communications Strength (ENV-str-E) as part of its content.].**Accountability Strength** (CGOV-str-E). The company has shown markedly responsible leadership on public policy issues and/or has an exceptional record of transparency and accountability concerning its political involvement in state or federal-level U.S. politics, or in non-U.S. politics [added in 2006]. **Other Strength**(CGOV-str-X). The company has an innovative compensation plan for its board or executives, a unique and positive corporate culture, or some other initiative not covered by other KLD ratings.

**CORPORATE GOVERNANCE** CONCERNS:

**High Compensation** (CGOV-con-B). The company has recently awarded notably high levels of compensation to its top management or its board members. The limit for a rating is total compensation of more than $\$10 million$ per year for a CEO or $\$100,000$ per year for outside directors. **Ownership Concern** (CGOV-con-F). The company owns between 20% and 50% of a company KLD has cited as having an area of social concern, or is more than 20% owned by a firm KLD has rated as having areas of concern. When a company owns more than 50% of another firm, it has a controlling interest, and KLD treats the second firm as if it is a division of the first. **Accounting Concern** (CGOV-con-G). The company is involved in significant accounting related controversies [added in 2006]. **Transparency Concern** (CGOV-con-H). The company is distinctly weak in reporting on a wide range of social and environmental performance measures [added in 2006]. **Political Accountability Concern** (CGOV-con-I). The company has been involved in noteworthy controversies on public policy issues and/or has a very poor record of transparency and accountability concerning its political involvement in state or federal level U.S. politics, or in non-U.S. politics [added in 2006].**Other Concern** (CGOV-con-X). The company restated its earnings over an accounting controversy, has other accounting problems, or is involved with some other controversy not covered by other KLD ratings.

**DIVERSITY** STRENGTHS:

**CEO** (DIV-str-A). The company's chief executive officer is a woman or a member of a minority group. **Promotion** (DIV-str-B). The company has made notable progress in the promotion of women and minorities, particularly to line positions with profit-and-loss responsibilities in the corporation. **Board of Directors** (DIV-str-C). Women, minorities, and/or the disabled hold four seats or more (with no double counting) on the board of directors, or one-third or more of the board seats if the board numbers less than 12. **Work/Life Benefits** (DIV-str-D). The company has outstanding employee benefits or other programs addressing work/life concerns, e.g., child care, elder care, or flextime [entered in 1991 with the name Family Benefits Strength, it was renamed in 2005]. **Women & Minority Contracting** (DIV-str-E). The company does at least 5% of its subcontracting, or otherwise has a demonstrably strong record on purchasing or contracting, with women- and/or minority-owned businesses. **Employment of the Disabled** (DIV-str-F). The company has implemented innovative hiring programs, other innovative human resource programs for the disabled, or otherwise has a superior reputation as an employer of the disabled. **Gay & Lesbian Policies** (DIV-str-G). The company has implemented notably progressive policies toward its gay and lesbian employees. In particular, it provides benefits to the domestic partners of its employees [entered in 1991 with the name Progressive Gay/Lesbian Policies strength, it was

[20] Own elaboration of definitions and groups are updated to the last KLD release.

renamed in 1995]. **Other Strength** (DIV-str-X). The company has made a notable commitment to diversity that is not covered by other KLD ratings.

**DIVERSITY** CONCERNS:

**Controversies** (DIV-con-A). The company has either paid substantial fines or civil penalties as a result of affirmative action controversies, or has otherwise been involved in major controversies related to affirmative action issues. **Non-Representation** (DIV-con-B). The company has no women on its board of directors or among its senior line managers. **Other Concern** (DIV-con-X). The company is involved in diversity controversies not covered by other KLD ratings.

**EMPLOYEE RELATIONS** STRENGTHS:

**Union Relations** (EMP-str-A). The company has taken exceptional steps to treat its unionized workforce fairly [entered in 1991 it was renamed from Strong Union Relations]. **No-Layoff Policy** (EMP-str-B). The company has maintained a consistent no-layoff policy [added in 1994]. **Cash Profit Sharing** (EMP-str-C). The company has a cash profit-sharing program through which it has recently made distributions to a majority of its workforce. **Employee Involvement** (EMP-str-D). The company strongly encourages worker involvement and/or ownership through stock options available to a majority of its employees, gain sharing, stock ownership, sharing of financial information, or participation in management decision-making. **Retirement Benefits Strength** (EMP-str-F). The company has a notably strong retirement benefits program. KLD renamed this strength from Strong Retirement Benefits. **Health and Safety Strength** (EMP-str-G). The company is noted by the US Occupational Health and Safety Administration for its safety programs. **Other Strength** (EMP-str-X).The company has strong employee relations initiatives not covered by other KLD ratings.

**EMPLOYEE RELATIONS** CONCERNS:

**Union Relations** (EMP-con-A). The company has a history of notably Poor Union Relations. **Health and Safety Concern** (EMP-con-B). The company recently has either paid substantial fines or civil penalties for willful violations of employee health and safety standards, or has been otherwise involved in major health and safety controversies. **Workforce Reductions** (EMP-con-C). The company has reduced its workforce by 15% in the most recent year or by 25% during the past two years, or it has announced plans for such reductions. **Retirement Benefits Concern** (EMP-con-D). The company has either a substantially underfunded defined benefit pension plan, or an inadequate retirement benefits program [entered in 1991 with the name Pension/Benefits Concern, it was renamed in 2004]. Other Concern. The company is involved in an employee relations controversy that is not covered by other KLD ratings.

**ENVIRONMENTAL** STRENGTHS:

**Beneficial Products and Services**(ENV-str-A). The company derives substantial revenues from innovative remediation products, environmental services, or products that promote the efficient use of energy, or it has developed innovative products with environmental benefits. (The term "environmental service" does not include services with questionable environmental effects, such as landfills, incinerators, waste-to-energy plants, and deep injection wells). **Pollution Prevention** (ENV-str-B). The company has notably strong pollution prevention programs including both emissions reductions and toxic-use reduction programs. **Recycling** (ENV-str-C). The company either is a substantial user of recycled materials as raw materials in its manufacturing processes, or a major factor in the recycling industry. **Clean Energy**(ENV-str-D). The company has taken significant measures to reduce its impact on climate change and air pollution through use of renewable energy and clean fuels or through energy efficiency. The company has demonstrated a commitment to promoting climate-friendly policies and practices outside its own operations [entered in 1991 it was renamed from Alternative Fuel Strength]. **Communications** (ENV-str-E). The company is a signatory to the CERES Principles, publishes a notably substantive environmental report, or has notably effective internal communications systems in place for environmental best practices.[added in 1996; it was incorporated with the Corporate Governance: Transparency rating (CGOV-str-D), which was added in 2005]. **Property, Plant, and Equipment** (ENV-str-F). The company maintains its property, plant, and equipment with above average environmental performance for its industry. [added in 1995]. **Management Systems** (ENV-str-G). The company has demonstrated a superior commitment to management systems through ISO 14001 certification and other voluntary programs [added in 2006]. **Other Strength** (ENV-str-X). The company has demonstrated a superior commitment to management systems, voluntary programs, or other environmentally proactive activities.

**ENVIRONMENTAL** CONCERNS:

**Hazardous Waste** (ENV-con-A). The company's liabilities for hazardous waste sites exceed $\$50 million$, or the company has recently paid substantial fines or civil penalties for waste management violations. **Regulatory Problems**. (ENV-con-B) The company has recently paid substantial fines or civil penalties for violations of air, water, or other environmental regulations, or it has a pattern of regulatory controversies under the Clean Air Act, Clean Water Act or other major environmental regulations. **Ozone Depleting Chemicals**. (ENV-con-C). The company is among the top manufacturers of ozone depleting chemicals such as HCFCs, methyl chloroform, methylene chloride, or bromines. **Substantial Emissions**. (ENV-con-D). The company's legal emissions of toxic chemicals (as defined by and reported to the EPA) from individual plants into the air and water are among the highest of the companies followed by KLD. **Agricultural Chemicals**. (ENV-con-E). The company is a substantial producer of agricultural chemicals, i.e., pesticides or chemical fertilizers. **Climate Change**. (ENV-con-F). The company derives substantial revenues from the sale of coal or oil and its derivative fuel products, or the company derives substantial revenues indirectly from the combustion of coal or oil and its derivative fuel products. Such companies include electric utilities, transportation companies with fleets of vehicles, auto and truck manufacturers, and other transportation equipment companies. **Other Concern**. (ENV-con-X). The company has been involved in an environmental controversy that is not covered by other KLD ratings.

**HUMAN RIGHTS** STRENGTHS:

**Positive Record in South Africa** (HUM-str-A). The company's social record in South Africa is noteworthy [existed only in 1994 and 1995]. **Indigenous Peoples Relations Strength**. (HUM-str-D). See Community Indigenous Peoples Relations (COM-str-E) [added in 2000 under Community, from 2004 moved in Human Rights]. **Labor Rights Strength** (HUM-str-G). The company has outstanding transparency on overseas sourcing disclosure and monitoring, or has particularly good union relations outside the U.S., or has undertaken labor rights-related initiatives that KLD considers outstanding or innovative [added in 2002]. **Other Strength**.(HUM-str-X) The company has undertaken exceptional human rights initiatives, including outstanding transparency or disclosure on human rights issues, or has otherwise shown industry leadership on human rights issues not covered by other KLD human rights ratings [entered in 1994].

**HUMAN RIGHTS** CONCERNS:

**South Africa** (HUM-con-A). The company faced controversies over its operations in South Africa [existed from 1991 to 1994]. **Northern Ireland** (HUM-con-B). The company has operations in Northern Ireland [existed from 1991 to 1994]. **Burma Concern**(HUM-con-C). The company has operations or direct investment in, or sourcing from, Burma. [added in 1995]. **Mexico** (HUM-con-D). The company's operations in Mexico have had major recent controversies, especially those related to the treatment of employees or degradation of the environment [existed from 1995 to 2002]. **Labor Rights Concern** (HUM-con-F). The company's operations have had major recent controversies primarily related to labor standards in its supply chain [added in 1998; it was lately renamed from the International Labor Concern]. **Indigenous**

**Peoples Relations Concern** (HUM-con-G). The company has been involved in serious controversies with indigenous peoples (either in or outside the U.S.) that indicate the company has not respected the sovereignty, land, culture, human rights, and intellectual property of indigenous peoples [added in 2000]. **Other Concern** (HUM-con-X). The company's operations have been the subject of major recent human rights controversies not covered by other KLD ratings.

**PRODUCT** STRENGTHS:
**Quality** (PRO-str-A). The company has a long-term, well-developed, company-wide quality program, or it has a quality program recognized as exceptional in U.S. industry. **R&D/Innovation** (PRO-str-B). The company is a leader in its industry for research and development (R&D), particularly by bringing notably innovative products to market. **Benefits to Economically Disadvantaged** (PRO-str-C). The company has as part of its basic mission the provision of products or services for the economically disadvantaged. **Other Strength** (PRO-str-X). The company's products have notable social benefits that are highly unusual or unique for its industry.

**PRODUCT** CONCERNS:
**Product Safety** (PRO-con-A). The company has recently paid substantial fines or civil penalties, or is involved in major recent controversies or regulatory actions, relating to the safety of its products and services. **Marketing/Contracting Concern** (PRO-con-D). The company has recently been involved in major marketing or contracting controversies, or has paid substantial fines or civil penalties relating to advertising practices, consumer fraud, or government contracting. (Formerly: Marketing/Contracting Controversy). **Antitrust** (PRO-con-E). The company has recently paid substantial fines or civil penalties for antitrust violations such as price fixing, collusion, or predatory pricing, or is involved in recent major controversies or regulatory actions relating to antitrust allegations. **Other Concern** (PRO-con-X). The company has major controversies with its franchises, is an electric utility with nuclear safety problems, defective product issues, or is involved in other product related controversies not covered by other KLD ratings.

**ALCOHOL (ALC-con-A)** : **Licensing**. The company licenses its company or brand name to alcohol products. **Manufacturers**. Companies that are involved in the manufacture alcoholic beverages including beer, distilled spirits, or wine. **Manufacturers of Products Necessary for Production of Alcoholic Beverages**. Companies that derive 15% or more of total revenues from the supply of raw materials and other products necessary for the production of alcoholic beverages. **Retailers**. Companies that derive 15% or more of total revenues from the distribution (wholesale or retail) of alcoholic beverages. **Ownership by an Alcohol Company**. The company is more than 50% owned by a company with alcohol involvement. **Ownership of an Alcohol Company**. The company owns more than 20% of another company with alcohol involvement. (When a company owns more than 50% of company with alcohol involvement, KLD treats the alcohol company as a consolidated subsidiary.) **(ALC-con-X)**: **Alcohol Other Concern**. The company derives substantial revenues from the activities closely associated with the production of alcoholic beverages [KLD assigned concerns in this category through 2002].

**GAMBLING (GAM-con-A)**: **Licensing**. The company licenses its company or brand name to gambling products. **Manufacturers**. Companies that produce goods used exclusively for gambling, such as slot machines, roulette wheels, or lottery terminals. **Owners and Operators**. Companies that own and/or operate casinos, racetracks, bingo parlors, or other betting establishments, including casinos; horse, dog, or other race tracks that permit wagering; lottery operations; on-line gambling; pari-mutuel wagering facilities; bingo; Jai-alai; and other sporting events that permit wagering. **Supporting Products or Services**. Companies that provide services in casinos that are fundamental to gambling operations, such as credit lines, consulting services, or gambling technology and technology support. **Ownership by a Gambling Company**. The company is more than 50% owned by a company with gambling involvement. **Ownership of a Gambling Company**. The company owns more than 20% of another company with gambling involvement. (When a company owns more than 50% of company with gambling involvement, KLD treats the gambling company as a consolidated subsidiary.) **(GAM-con-X)**: Gambling Other Concern The company derives substantial revenues from the activities closely associated with the production of goods and services closely related to the gambling industry or lottery industries [KLD assigned concerns in this category through 2002].

**TOBACCO (TOB-con-A)**: **Licensing** The company licenses its company name or brand name to tobacco products. **Manufacturers**. The company produces tobacco products, including cigarettes, cigars, pipe tobacco, and smokeless tobacco products. **Manufacturers of Products Necessary for Production of Tobacco Products**. The company derives 15% or more of total revenues from the production and supply of raw materials and other products necessary for the production of tobacco products. **Retailers**. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of tobacco products. **Ownership by a Tobacco Company**. The company is more than 50% owned by a company with tobacco involvement. **Ownership of a Tobacco Company**. The company owns more than 20% of another company with tobacco involvement. (When a company owns more than 50% of company with tobacco involvement, KLD treats the tobacco company as a consolidated subsidiary). **(TOB-con-X)**: **Tobacco Other Concern** The company derives substantial revenues from the production of tobacco products [added in 2002].

**FIREARMS (FIR-con-A)**: **Manufacturers**. The company is engaged in the production of small arms ammunition or firearms, including, pistols, revolvers, rifles, shotguns, or sub-machine guns. **Retailers**. The company derives 15% or more of total revenues from the distribution (wholesale or retail) of firearms and small arms ammunition. **Ownership by a Firearms Company**. The company is more than 50% owned by a company with firearms involvement. **Ownership of a Firearms Company**. The company owns more than 20% of another company with firearms involvement. (When a company owns more than 50% of company with firearms involvement, KLD treats the firearms company as a consolidated subsidiary) [added in 1999].

**MILITARY (MIL-con-A)**: **Manufacturers of Weapons or Weapons Systems**. Companies that derive more than 2% of revenues from the sale of conventional weapons or weapons systems, or earned 50 million or more from the sale of conventional weapons or weapons systems, or earned 10 million or more from the sale of nuclear weapons or weapons systems. **Manufacturers of Components for Weapons or Weapons Systems**. Companies that derive more than 2% of revenues from the sale of customized components for conventional weapons or weapons systems, or earned 50 million or more from the sale of customized components for conventional weapons or weapons systems, or earned 10 million or more from the sale of customized components for nuclear weapons or weapons systems. **Ownership by a Military Company**. The company is more than 50% owned by a company with military involvement. **Ownership of a Military Company**. The company owns more than 20% of another company with military involvement. (When a company owns more than 50% of company with military involvement, KLD treats the military company as a consolidated subsidiary) [entered since 1991]. **(MIL-con-B)**: **Minor Weapons Contracting Involvement**. The company has minor involvement in weapons-related contracting. In the most recent fiscal year for which information is available, it derived 10 to 50 million in conventional weapons-related prime contracts (when that figure is less that 2% of revenue), or 1 to 10 million from nuclear weapons-related prime contracts [existed just from 1991 to 2002]. **(MIL-con-C)**: **Major Weapons-related Supplier**. During the last fiscal year, the company received from the Department of Defense more than 50 million for

fuel or other supplies related to weapons [existed just from 1991 to 2002]. **(MIL-con-X)**: **Military Other Concern**. The company has substantial involvement in weapons-related contracting. In the most recent fiscal year for which information is available, it derived more than 2% of sales or 50 million from weapons-related contracting, or it received more than 10 million in nuclear weapons-related prime contracts [existed just through 2002].

**NUCLEAR POWER (NUC-con-A)**: **Construction & Design of Nuclear Power Plants**. The company designs, engineers, and constructs nuclear power plants and nuclear reactors for use in nuclear power plants; including companies that design nuclear reactors and engineer and/or construct nuclear power plants. **Nuclear Power Fuel and Key Parts**. The company supplies nuclear fuel material and key parts used in nuclear plants and reactors. Fuel includes mining of uranium and conversion, enrichment, and fabrication of uranium. Key parts include manufacture or sale of specialized parts for use in nuclear power plants including but not exclusive to steam generators, control rod drive mechanisms, reactor vessels, cooling systems, containment structures, fuel assemblies, and digital instrumentation & controls. **Nuclear Power Service Provider**. The company is involved in the transport of nuclear power materials and nuclear plant maintenance. **Ownership of Nuclear Power Plants**. The company has an ownership interest or operates nuclear power plant(s). Does not include publicly traded companies that are an owner or operator of a nuclear plant that has shut down and is being decommissioned. **Ownership by a Nuclear Power Company**. The company is more than 50% owned by a company with nuclear power involvement. **Ownership of a Nuclear Power Company**. The company owns more than 20% of another company with nuclear power involvement. If company ownership of company with nuclear power involvement is greater than 50%, KLD treats subsidiary as a consolidated subsidiary. **(NUC-con-C)**: **Design**. The company derives identifiable revenues from the design of nuclear power plants. This category does not include companies providing construction or maintenance services for nuclear power plants [existed just through 2002; it was re-instated as Construction & Design of Nuclear Power Plants under the code NUC-con-A in 2005]. **(NUC-con-D)**: **Fuel Cycle/Key Parts**. The company mines, processes, or enriches uranium, or is otherwise involved in the nuclear fuel cycle. Or, the company derives substantial revenues from the sale of key parts or equipment for generating power through using nuclear fuels. [existed just through 2002; it was re-instated as Nuclear Power Fuel and Key Parts under the code NUCcon- A]. **(NUC-con-X)**: **Nuclear Power Other Concern**. The company is involved in the production of Nuclear Power[existed just through 2002].